'INTRUSIONS?'

by the same author

AN EXPERIMENT WITH TIME

THE SERIAL UNIVERSE

NOTHING DIES

'INTRUSIONS?'

BY

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FABER AND FABER
24 Russell Square
London

First published in mcmlv
by Faber and Faber Limited
24 Russell Square, London W.C.1
Printed in Great Britain by
Latimer Trend & Co Ltd Plymouth

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INTRODUCTORY NOTE

The arrangement of this book might well have been different if my husband had lived to complete it himself; but it seems best that it should now be published as nearly as possible as he left it.

It was written with a sense of urgency and in circumstances of chronic ill-health. Moreover, during the war, he felt impelled to put aside the writing in order to produce a modern version of his early aircraft design. But, as he wrote in a letter to a friend—'This was a long business; and in the middle of it, I went down with severe pneumonia.

'Then a very odd thing happened. Note that I had been putting off writing *Intrusions?* because I thought the aeroplane more immediately important. But bear this in mind: I funked writing that book, and there would *never* have come a time when I should not have found something more important to do.

'Well, when I recovered from the pneumonia, I found that the pleura had stuck fast to the left ribs. Bending over the drawing board would bring on most violent attacks of pain. However, I struggled along. Then I had a half-waking dream in which I was being scolded. The gist of the tirade was the ridiculous assertion that it would be a two-thousand-years-long calamity for mankind if I failed to clear up what remained to be cleared up in the theory of Serialism; that I had been granted an extension of time in which to do so; and that I was to start using that time at once. Then, while I still

hesitated, there developed suddenly an acute neuritis in my right triceps, which prevented me from lifting my arm to the drawing board at all!

'It was obvious that the projected aeroplane could never be finished now in time to be used in the war. While, as regards the neglected book: it was quite possible that I had missed something important and was subconsciously aware of the fact.

'Then the dream came again. "Hurry! *Hurry*!" said the voice, subconscious or otherwise. Two words only. But I left the drawings on the board and hurried. And it was lucky that I did so. I *had* missed something, and that something was the most important fact that it is possible to imagine.

'The book has taken me two years to work out and write. During that time the neuritis in the arm partly subsided; but the other troubles have increased and have been complicated by a weakening heart muscle. So the discovery in question might have been postponed for an indefinite period if I had expended those two years in aeronautical research.'

In August 1946 my husband was operated on for a perforated duodenal ulcer, and this was followed by another operation in March 1947. His remaining time was devoted to the revision of his earlier book *Nothing Dies*.

The Introduction re-states the theory of Serial Time, and argues that every act of planning an experiment is itself an experiment proving the separateness of mind and brain. The author is concerned, as in his earlier books, to show two main things; first, that the mind and brain are separate, the relative movement between them being commonly called 'the Passage of Time', and secondly, that minds are parts of a Universal Mind. The writing of this Introduction, however, led the author to make what he considered to be important additions stating the physical aspect of his theory and show-

ing how it stands in relation to the work of Eddington; and this is the subject of the Appendix.

The central part of the book is mainly autobiographical and describes certain experiences, which my husband called 'Intrusions'.

I should like to express my gratitude to Mr. Michael Birkin for his invaluable help in editing my husband's work; particularly in constructing Diagram 4 which was missing and in bridging the gap which occurred in the MS. at that point (pp. 35, and 36). This gap was due to the fact that my husband had started a revision of the Introduction but had not been able to finish it. He had intended, furthermore, to rewrite the first two chapters of the main book. Those parts of the Introduction which would probably have been rewritten are indicated by a footnote at the pages concerned.

I should also like to express my thanks to Mr. R. H. I. de la Mare for his guidance and encouragement; to the Rev. Dr. Leslie W. A. Ahrendt for his great help in correcting the proofs of the mathematical appendix and to my son for his account of the fourth Intrusion which my husband had related to us, but had not written down.

CECILY DUNNE

FOREWORD

This rather queer history began as a series of letters to a friend. He wishes to remain anonymous, and that wish I have respected; but I have adhered to the espitolary style throughout.

Although the book is not, strictly speaking, about what is known as 'Serial Time', most of the apparent 'intrusions' had a direct or indirect bearing upon that subject. One in particular was the slightly remote cause of a striking advance in the general theory, and that discovery I have had to describe. This was an easy task so far as my friend was concerned, since he had studied two of my earlier books; but I had not proceeded very far with the writing before I realized that a reader who lacked my friend's previous knowledge would be unable to make head or tail of the story. Consequently, I have added, for anyone to whom the theory is new or imperfectly understood, a brief *Introduction* explaining what 'Serialism' really is. When he has skimmed through that, he will be, I hope, able to follow the adventures chronicled later without having all chance of enjoyment spoiled by complete mystification.

Following the precedents of Plato, Poe and Dr. Conan Doyle, I enlisted for the purposes of that *Introduction* the services of what is known as a 'Watson'. His business was to ask such questions as I knew must arise in the minds of many readers. Greatly to my surprise, I found myself unable to con-

trol him. The consequences have been a little disastrous to the 'make-up' of the book; and, for this, I tender to all concerned my sincere apologies.

INTRODUCTION

'Serialism' is the long-overdue examination of a very remarkable intellectual phenomenon. It has been found that, whenever you try to ascertain your relation to the seeming world in which you seem to exist, your conceptions of 'time', 'space', 'reality', 'being', 'mind' and 'I' begin to recede in a curious succession of backward *jumps*. The result is that, in these attempts, you are confronted always by what I have called, 'serial time', 'serial space', 'serial reality', 'serial being', 'serial mind' and a 'serial I'. I shall give you in a moment an example of this oddity in your thinking processes. Our attitudes towards this phenomenon have varied according to our individual temperaments. Philosophers, being rather quicker in the uptake than are physicists, have, usually, foreseen the impending 'regress' (their misnomer for this backward-jumping behaviour), and have halted in dismay. Physicists, with one notable exception, appear to have gone forward without misgivings until they have been arrested by the inevitable emergence of what *look like* the most appalling anomalies. Then they have set to work to devise mathematical descriptions of those anomalies which should render them reasonable. But such mathematical descriptions can serve that purpose only when they are so complicated that they introduce, unnoticed by their constructors, those identical backward-jumps which were, originally, overlooked.

'Serialism' is, thus, the only '-ism' which has made any profound and thoroughgoing analysis of these curious 're-

gressions'; and its results have been so startling that many people, unable to contradict them on any other grounds, declare that they are 'too good to be true'. This criticism does not seem to be anything beyond an eruption of the abysmal inferiority-complex engendered in poor mankind by the bludgeonings of nineteenth century materialists and the scoldings of the more recent 'naturalistic philosophers'.

Now, the regressions of which I have been speaking are, I repeat, intellectual—*occurrences in the procedure of your thinking.* Serialism, therefore, has employed since 1934 a 'tabular' method of analysis designed to save you from confusion of thought. This consists of an arrangement of compartments inside each of which is shown what we are really thinking at that stage of our thinking. The result is to exhibit very clearly, not only *how* it is that the regressions occur, but also why their occurrence is inevitable.

I declared, in the opening sentence of this *Introduction,* that the regressions occur whenever 'you try to ascertain your relation to the seeming world in which you seem to exist'; and I promised, a little later, to give you an example of this 'oddity in your thinking processes'. You may object that you are unsuited to my purpose; giving as your reason that you are a 'Solipsist', i.e., a man who does not believe that there *is* any world other than him. But my formula has forestalled that objection. You are not asked to admit that there *is* such a world, but only that such a world there *seems* to be, and that in this seeming world you *seem* to exist.

If you complain that even this 'seeming' is a very elusive affair, and that you could not swear always that there does seem to be such a world, I can help you over that difficulty. There is always a seeming *restriction on your freedom:* a seeming restriction which prescribes for you what is 'here' and what is 'now' and which hampers you when you try to move your seem-

ing limbs. If you will admit this, that will be all that I shall require of you. For to *be* restricted is to be conforming to that which restricts; and this, from the physical point of view, is to be 'observing' that which restricts. So, to *seem* to be restricted is to *seem* to be observing a world which is other than you.

To describe such a world is, of course, the aim of pure physics; and physics is not necessarily materialistic. But the Materialist requires such a world for the starting point of his argument. I shall, in this *Introduction*, put him into the witness-box and ask him to describe how he regards his own relation to the seeming world in which he seems to be existing. You will be able, in that way, to compare his mental procedure with your own.

The Materialist I have in mind is no mere question-begging fulminator against 'conceit' and 'anthropomorphism'. He is intelligent enough to realize that all our knowledge is *human* knowledge, so that all world-descriptions, including his own, must be anthropomorphic. He knows that Man must needs be the measure of every universe *as described by Man*. But he is philosopher enough to perceive that this does not lead directly to Idealism. He recognizes that, though all our knowledge is *our* knowledge, it is knowledge *of* something. Such knowledge is not, necessarily, confined to knowledge about the knower—to self-consciousness. If there is, as logically there may be, something other than the knower, no difficulty in disentangling that something from its *relations* to the knower would constitute a denial of its existence. Beneath the possibly irremovable wrappings there could lie a residual element which would affect the character of those wrappings. If the Materialist, having established this standpoint, were asked what direct evidence he had of the existence of any such buried 'residual element', his answer would boil down to yours: his freedom seems to be *restricted.*

I shall assume, however, that this model opponent is ignorant of the distinction drawn by Scholastic Philosophy between 'Being' and 'Existence' (of which more anon). In that respect he will be in no way inferior to most modern physicists—including, so far as I can see, Eddington. Furthermore, I shall pretend that he is as 'woolly' on the subject of 'sense-data' as was Thomas Huxley. This is unfair, in that such an attitude is not representative of a modern, educated Materialist; but I want to postpone discussion of sense-data to the first chapter of the book proper, and to make my Materialist deal with physical considerations only. It is there that he can present his case in its greatest strength.

That case is simple. He proposes to equip his physical world with the character of 'endurance'. Thereafter, he intends to argue that, since this world has endured for millions of years before he came into being, it not only owes nothing of its *essential* nature to him and his human outlook thereon but is, on the contrary, the probable sole cause of his own brief being and limited mentality.

He begins by asserting the existence of a physical world which is changing its states. Those changes take time—real time—the only time there is. He is part of that physical world. But he is a very clearly defined part; so it is possible for him to divide the whole physical world into two separate systems, namely: the part which is him and the part which is his 'environment'. Now, the environment system has endured for ages which render almost negligible the endurance of the system which is him. The environment, also, is practically certain to endure for ages after his tiny system has disintegrated. It would be absurd, therefore. . . .

Serialism, however, with its rather ponderous procedure of establishing, at each stage of a man's thinking, exactly what it is that the man is thinking about, interrupts the Materialist

at this point with one of its irritating questions. It asks him how he knows that this environment of his has had, and will have, such vast endurance. He replies promptly that all knowledge of the past is an inference from the evidence provided by the physical world in its present state: e.g. natural records of what appear to be past states; photographs or documentary descriptions. Even if these were lacking, he declares, *some* evidence of the past is obtainable from one of his own present states. For the reactions of his brain to its environment leave present traces in that brain. These traces can be restimulated so as to produce what are called in popular phraseology, 'memories' or 'memory images'; and these constitute observable records of the environment's past states. The immense age of the environment is, however, deducible from the evidence afforded by rock-strata. The belief in future states is based upon the obvious fact that it is highly improbable that a world which has endured for so many aeons should, at this particular moment, and for no predictable reason, cease to exist.

'Very good,' says the Serialist, 'you have made it clear that your knowledge of the physical world in its past and future states is derived always from the evidence provided by some single state of this same, changing physical world—a state which is being regarded by you as "now". But how do you consider that you are related to this physical world? That, you will remember, was the original question.'

Now, the Materialist's entire argument necessitates his claiming that he is merely a part of the physical world—a part which interacts with its environment. He has satisfied himself on that point long ago, and he has his answer ready. He is, he declares, essentially a physical brain with an attendant, more extended, physical nerve system. For example: if L, M and N represent respectively a past, a present and a

uture state of his environment, then *l*, *m* and *n* will represent corresponding past, present and future states of his brain; so that the three pairs $\frac{L}{l}$, $\frac{M}{m}$ and $\frac{N}{n}$ will represent past, present and future states of his brain interacting with its environment. His reasons for this assertion are: (1) That much of his nerve system is as readily discoverable by his own manual exploration as is that system's environment, and that nothing save the resulting injuries would prevent him from discovering the brain itself in the same way: (2) He can prove, by his own, less direct experiments upon this nervous system, that it is interacting with its environment: (3) Physiologists, when consulted, assure him that operations upon living brains prove that these are merely parts of the general physical world.

The Serialist prepares obediently a compartment of his Table containing the Materialist's $\frac{L}{l}$, $\frac{M}{m}$ and $\frac{N}{n}$. Here it is:

FIGURE 1

A.2.		
L	M	N
l	m	n

He labels it, for some private reason, A.2.

The Materialist proceeds to explain that this arrangement exhibits the physical world as a *sequence* of states in time order; the relation of 'earlier' and 'later' being indicated by the *alphabetical* sequence of the letters and not necessarily by the spatial positions of the pairs—which last is merely a convenience for picking out the important alphabetical sequence with the minimum of trouble. (His aim here is to avoid being jockeyed into an apparent assertion that time is a fourth dimension, additional to the three dimensions of ordinary space in which each of the selected states has its being.) He

declares now that the time sequence represented by the alphabetical sequence is to be regarded as practically predetermined, inasmuch as the nature of each of the states therein depends mainly upon the nature of the state which preceeds it in the sequence.*

But the Serialist has another question to put. He wants to know how the Materialist, in the descriptions he is giving of the physical world, is dealing with what are known as scientific 'experiments'.

The Materialist sees no difficulty here. He has pointed out earlier that his brain and its environment are two separate systems which can interact. His brain, he declares, can decide to release stored energy and to transfer this to the environment for experimental purposes. We may, if we so please, assume that *l* effected such an interference with L, and that M and *m* are the results of such an experiment. But the so-called 'motive' which actuated *l* was merely a mechanical, predestined consequence of *l*'s physical history.

'And I may add,' he concludes triumphantly, 'that it is this matter of testing by experiment which sets Science so far above mere metaphysical theory. Science in the past has undergone many changes, and these, recently, have been quite revolutionary in character. In such cases, new theories have to be devised to fit the newly discovered facts. There are usually, many such theories—conflicting theories—which fit. But always there has been some scientific genius who has been able to invent some form of *experiment* which has been decisive in proving which new theory was false and which

* *Note for physicists.* This macroscopic determinism suffices for our present argument. But, actually, in the absence of experimental interference by an Observer outside the A.2. sequence, that sequence is *completely* deterministic. The proof of this was given in the first edition of *The Serial Universe*, pages 179, 180, 181. In the second (revised) edition, the pages are 177, 178, 179.

was true. Now you, so I have heard, have a new theory of time. But you can provide no experimental test of its truth, so it remains merely a theory.'

It would both shorten and simplify the argument now if we were to adopt the dialogue form of discussion; and this, with the Reader's permission, I shall proceed to do.

Serialist. 'I am afraid that you are mistaken about that. There *is* an experimental test of the truth of my theory; and it is one which, like all properly scientific tests, you can perform yourself.'

Materialist. 'But . . . surely that is impossible!'

Serialist. 'No. Tell me! can *you* perform one of your classical scientific experiments for me now? Can you interfere with—alter—your brain's environment, prophesy what the consequences will be, and shew me, a little later, that your prophecy has been fulfilled?'

Materialist. 'Of course I can: that is the ordinary procedure of science.'

Serialist. 'Can you alter a *past* state of your brain's environment? I mean, assuming that $\frac{M}{m}$ is the present state of the physical world, can you alter L in the $\frac{L}{l}$ state, and show me the consequences in M?'

Materialist. 'Of course I cannot. If the present state of my brain is *m*, this is not in association with the past state L, so no interaction between *m* and L is possible.'

Serialist. 'But you can alter M?'

Materialist. 'Yes. I have said so.'

Serialist. 'Very well. Here is your test. *Wait a little while*, and you will find that you are no longer able to alter M. For *n* will have become the present state of your brain, and that state is not in association with M.'

Materialist. 'Of course that is true, but I fail to see that it is a test of anything.'

Serialist. 'Is it not? Think again! When $\frac{L}{l}$ was the present state of the physical world, *you* could alter L. When $\frac{M}{m}$ became the present state, *you* could no longer alter L but could alter M. When $\frac{N}{n}$ becomes the present state, *you* will be able to alter N but will have lost the ability to alter M. What you have discovered is that *your* ability to alter changes, in real time, from association with $\frac{L}{l}$ to association with $\frac{M}{m}$ and thereafter to association with $\frac{N}{n}$.'

Materialist. 'Of course *I* can alter my environment only in the state which is present to *me*. But my whole point is that 'I' am merely the present state of my brain—I mean of 'a' brain.'

Serialist. 'Yet you agree that, whatever you are, your ability to alter is confined to the state which *you* regard as the 'present' state?'

Materialist. 'Yes.'

Serialist. 'Very well. Your brain *m* is supposed to be regarding the environment M as being in its present state?'

Materialist. 'Yes.'

Serialist. 'And, a little while ago, *l* was regarding L as the environment in its present state?'

Materialist. 'Yes.'

Serialist. 'And, a little later on *n* will be regarding N as the environment in its present state?'

Materialist. 'Yes.'

Serialist. But, in the descriptions you have given of $\frac{L}{l}$, $\frac{M}{m}$

and $\frac{N}{n}$, *there is nothing to show that l is not regarding L as* the present state or that *n is* not making a similar judgement about N!'

Materialist. 'But $\frac{L}{l}$ and $\frac{N}{n}$ do not *exist.* The one pair is past and the other is future. $\frac{M}{m}$ is supposed to be the present and existing state of the physical world.'

Serialist. 'And M is the state of the environment which *you* perceive as 'existing' when I ask *you* to perform an experiment.'

Materialist. 'Yes.'

Serialist. 'Very well. You have described as *l* in $\frac{L}{l}$ a brain which is just as capable of regarding its environment as being in its present, existing state as is the brain *m* which you have described in $\frac{M}{m}$. In other words, there is nothing in the nature of the three composite states you have described which could make any one pair more present or 'existing' than the other two.'

Materialist. 'Well, I suppose that is true; but. . . .'

Serialist. 'Wait! How, then, could the *brain* described in those three pairs perceive—as *you* perceived—M as *uniquely* present, existing and assailable for experimental purposes?'

Materialist. 'Yes, I see the difficulty there. But the solution of the problem appears quite simple to me. Everybody knows that there is a 'now' in time and that everything which exists has to be 'now'. But that 'now', conferring existence, is inherent in the nature of *time* and is, as you say, in no way dependent upon the natures of the *states* described as 'past' or 'present' or 'future'. When I described $\frac{M}{m}$ as the physical

world in its present state, I was not exercising any selective judgement in the matter. It was a hard fact, *forced* upon me by a time which is quite beyond my control, that M was present and existing and assailable for experimental purposes.'

Serialist. 'So *you* can discover something which your brain in the A.2. sequence cannot discover: namely, that *one* of the states of that physical world which includes both brain and brain's environment is uniquely 'now'?'

Materialist. 'Eh? What's that?' (Prolonged pause) 'Well, yes: your experiment does seem to establish that.'

Serialist. 'So you are something more than your brain?'

Materialist. 'But . . . Oh! very well. *Yes.*'

Serialist. 'So, when you interfere with your brain's environment for experimental "purposes", you do so *via* your brain?'

Materialist. 'Well, I could not alter my brain's environment in any other way, could I?'

Serialist. 'So your *primary* interference is with your brain?'

Materialist. 'Yes. There is no need to dwell upon the obvious.'

Serialist. 'But that interference involves that the particular brain-state in the A.2. sequence which you are altering in this way is receiving a modicum of physical energy for the supply of which *you,* outside A.2., are responsible?'

Materialist. 'Yes.'

Serialist. 'And this "now" of yours, which is, you say, imposed upon you by a time quite beyond your control, must be something possessing physical significance. For, in the absence of that "now", the brain-state to be altered for experimental purposes could not receive the needed physical energy from outside the A.2. sequence?'

Materialist. 'Well, if you like to word it that lengthy way, yes.'

Serialist. 'Moreover, it confers, as you said, *existence* upon

the members of the A.2. sequence, one after another, singly in succession?'

Materialist. 'Yes.'

Serialist. 'Obviously, it cannot be less real than is that state upon which it is *conferring* existence?'

Materialist. 'I agree to that.'

Serialist. 'So, to sum up, you must needs include that "now" in the total world you are considering—include it (1) as something which is as real as anything in A.2., and (2) as something which possesses *physical* significance?'

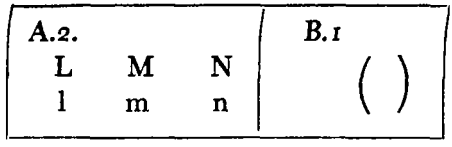
Materialist. 'Wait! Let me run over the last few questions and answers again.' (After a pause) 'All right, I grant you that.'

Serialist. 'Good! So we have something real and physical which is changing from association with *l* to association with *m*, and so on, rendering those states assailable by you one after another, singly in succession. That is the substance of my theory of time, and it is all that I need to prove by experiment. But please note this: Just as is the case with your own experiment, *every* experiment, of *any* kind, made by *any* scientist, for *any* purpose, constitutes an *experimental proof of the truth of the theory in question.*'

Materialist. 'Well, if that is all that your theory amounts to; it is true enough that every experiment is a test of its validity. But I do not see that it makes any difference to my case against survival.'

Serialist. 'That is where my table will help you. This "now" of yours, constituting a physical facility for interference, does not appear in the sequence of states I have labelled A.2. But it is something which has to be taken into account in the larger physical world you are considering. So we must add a compartment in order to complete that world—a compartment containing, let us call it *pro tem.*, the "now-mark". Then the world of which you are thinking will be this:'

FIGURE 2



'I have employed a pair of brackets to represent the "now-mark"; because it is sometimes convenient in argument to show that symbol in actual association with one of the states in the A.2. compartment, like, for example, this, $\binom{M}{m}$ or this $\binom{L}{l}$ or this $\binom{N}{n}$. At present it is supposed to be associated with $\underset{m}{M}$. Earlier, it was associated with $\underset{l}{L}$, and later it will be associated with $\underset{n}{N}$. But it is to be remembered that it is not static like the three states in A.2. It is being associated with one after another of those states, singly in succession. And, because that "now-mark" is a physical thing existing independently of the states with which it becomes associated, those successive associations of the "now-mark" with each of the states in turn constitute *events in real time.*

'Therefore, the sequence of states shown in A.2. does *not* represent the succession of events in *real time.* In the world which you are considering, represented by the row of two compartments, A.2. and B.1., only one such real event is indicated: namely, the supposed momentary association of the "now-mark" with the state $\underset{m}{M}$.

'But all the states shown in the A.2. sequence are *parties* to those events. Without them there could be no such events. The "now-mark" coming into association with nothing would not constitute an event.

'So the present state of the total world you are considering is $\begin{matrix} L \\ l \end{matrix} \left(\begin{matrix} M \\ m \end{matrix}\right) \begin{matrix} N \\ n \end{matrix}$, the "now-mark" having changed from association with $\begin{matrix} L \\ l \end{matrix}$ to association with $\begin{matrix} M \\ m \end{matrix}$ and being about to change to association with $\begin{matrix} N \\ n \end{matrix}$. A past state of that world would be $\left(\begin{matrix} L \\ l \end{matrix}\right) \begin{matrix} M & N \\ m & n \end{matrix}$, where ( ) has just come into association with $\begin{matrix} L \\ l \end{matrix}$ and is about to change to association with $\begin{matrix} M \\ m \end{matrix}$. A future state would be $\begin{matrix} L & M \\ l & m \end{matrix} \left(\begin{matrix} N \\ n \end{matrix}\right)$, where ( ) has just changed from association with $\begin{matrix} M \\ m \end{matrix}$ to association with $\begin{matrix} N \\ n \end{matrix}$.

'If you want to exhibit those three states as a *sequence* of states, you must proceed like this:

FIGURE 3

State 3	$\begin{matrix} L \\ l \end{matrix}$	$\begin{matrix} M \\ m \end{matrix}$	$\left(\begin{matrix} N \\ n \end{matrix}\right)$
State 2	$\begin{matrix} L \\ l \end{matrix}$	$\left(\begin{matrix} M \\ m \end{matrix}\right)$	$\begin{matrix} N \\ n \end{matrix}$
State 1	$\left(\begin{matrix} L \\ l \end{matrix}\right)$	$\begin{matrix} M \\ m \end{matrix}$	$\begin{matrix} N \\ n \end{matrix}$

'State 2 is the State which is "now" in what you are considering to be real time. State 1 is past in that time, and State 3 is future in that time. Note that everything in 1 is past, everything in 2 is present, and everything in 3 is future. Thus, the three States show the past, present and future States of the thing represented by ( )—the physical thing which we have agreed to refer to as the "now-mark".

'If you leave out the square brackets enclosing that State 2 which is "now" in what we have come to regard as real time, you will have a world analogous to the world you described in A.2. In this world, as in that, there would be nothing to show that any of the three States, 1, 2 or 3, is more "now" and "existing" than another; and so there would be no means of discovering with which of the A.2. states the present State of the lesser "now-mark" ( ), is associated. But, if you add the square brackets representing what has proved to be "now" in real time (let us call it "now-mark-2"), you have, according to your original definition of "existence", everything in State 2 as existing. So that the smaller brackets surrounding $\underset{m}{M}$ become *the existing State of your original "now-mark"*.

'You will have grasped, of course, that this original "now-mark" retains its potency to the extent that it confers special significance upon that $\underset{m}{M}$ state with which it, (in its real-time present State) is being associated. It can be, no longer, regarded as a conferrer of *existence* in real time; for existence in real time is conferred by "now-mark-2"—the square brackets enclosing State 2. Everything in State 2 exists, including $\underset{m}{M}$; but *all* owe their existence to the more spacious "now-mark-2". The $\left(\underset{l}{L}\right)$ in the past State 1 is being regarded as non-existent, despite the curved brackets, simply because it is not contained within that "now-mark-2". But you will remember that the $\underset{m}{M}$ associated with the lesser "now-mark" was credited by you with two characteristics. It was, you declared, "existing". I agreed to that, knowing that this $\underset{m}{M}$ did

"exist"—in the more capacious world of State 2. But it was also, you said, the only state which was assailable by you for experimental purposes. You could not, you averred, alter *the world in a state which was "past" in relation to what you were regarding then as "now". That is to say, you could not* alter $\overset{L}{1}$ in State 2. That was correct, and your original, lesser "now-mark" retains its potency in that respect. It does not confer existence in real time; but it remains *a physical facility enabling you to alter.* If you do not believe me, try to alter $\overset{L}{1}$, which exists in State 2 just as much as does $\overset{M}{m}$.

' "Now-mark-2" is also a facility for altering. It cannot enable you to alter $\overset{L}{1}$, with which "now-mark-1" is not associated; but it enables you to employ "now-mark-1" (in its real-time, present condition) as a means for the passage of the required energy.'

Materialist. 'I follow you so far as you have gone; but now the earlier argument must come into operation again. Your "now-mark-2" has to be thought of as having changed from association with State 1 to association with State 2, and as being about to change to association with State 3. These changes will be the *real* events in *real* time. And so it must go on! Real time is receding, and with it goes the real "now", and with that goes the criterion of real "existence".'

Serialist. 'Precisely. I asserted, in the first paragraph of this *Introduction,* that if you tried to ascertain your relation to the seeming world in which you seem to exist, you would find your conceptions of "time", "reality", "being" and "mind" receding in exactly that fashion—in a series of "jumps".'

Materialist. 'But your series is what mathematicians call "divergent"!'

Serialist. 'The general reader may not be able to understand the meaning of that word; but I can give you your answer, and he will be able to see a little later what it is that we are talking about. The series is "*convergent*" in the only characteristic that signifies.'

Materialist. 'The only characteristic that signifies! What is that?'

Serialist. 'Its *significance*. Listen!

'When "now-mark-1" changes from association with $\overset{L}{}_{1}$ to association with $\overset{M}{}_{m}$, it will find that the condition of brain and environment has changed. $\overset{M}{}_{m}$ is *different* from $\overset{L}{}_{1}$. Eventually that "now-mark" will come into association with a state in which brain has vanished—disintegrated. But when "now-mark-2" changes from association with State 1 to association with State 2 it finds $\overset{L}{}_{1}$ still existing, *unaltered* and *unalterable*. And, no matter how far you pursue real time in its receding, "now-mark-2" will never, in the whole endless table, become associated with a world in which $\overset{L}{}_{1}$, as brain interacting with environment, is not existing, unchanged, in that security. So the *significance* of the step which brings to light "now-mark-2" is (there is no other word for it) *tremendous*.'

Materialist. 'That queer—shall we call it "immortality"—must apply to every state of the physical world which *has been* associated with "now-mark-1"?'

Serialist. 'Exactly! But note now how the *significance* of each step after the first dwindles as we follow our receding real

time. The first step brought to light the surprising fact that everything which *has been* associated with "now-mark-1" remains in existence. Very well. That which constitutes the *present*, existing world in the next stage of the pursuit is the whole content of Figure 3 (repeated below), including "now-mark-2"—in its present State—and the three previously considered states of "now-mark-1".'

FIGURE 3 (repeated)

State 3	$\begin{matrix}L\\l\end{matrix}$	$\begin{matrix}M\\m\end{matrix}$	$\left(\begin{matrix}N\\n\end{matrix}\right)$
[State 2	$\begin{matrix}L\\l\end{matrix}$	$\left(\begin{matrix}M\\m\end{matrix}\right)$	$\begin{matrix}N\\n\end{matrix}$]
State 1	$\left(\begin{matrix}L\\l\end{matrix}\right)$	$\begin{matrix}M\\m\end{matrix}$	$\begin{matrix}N\\n\end{matrix}$

'Note again that $\begin{matrix}L\\l\end{matrix}$, once it is secure from interference *via* any "now-mark-1", persists unaltered in State 3 and in as many States 4, 5, 6, etc., as we care to consider. This means that *the "flow" of time so far as physics is concerned has ceased* for $\begin{matrix}L\\l\end{matrix}$! $\begin{matrix}L\\l\end{matrix}$ is eternally present. Regarding Figure 3 as the present state of a more comprehensive world adds nothing so far as $\begin{matrix}L\\l\end{matrix}$ is concerned. For $\begin{matrix}L\\l\end{matrix}$ the "regress" is ended. Nevertheless, the step which elevates Figure 3 to its proper status as being *wholly* present in real time does bring to light something which would not be apparent if we were content to rest with "now-mark-2" as the ultimate "now-mark". You will realize, of course, that the step in question still leaves $\left(\begin{matrix}M\\m\end{matrix}\right)$, in the centre of the array, as the only state which you can alter for experimental purposes. Suppose that you do alter it.

Then $\underset{m}{M}$ in State 2 becomes different from the $\underset{m}{M}$ in State 1. $\underset{m}{M}$ in State 1 is what *would have been* left in State 2 if you had refrained from interfering. And it would have endured, unalterable, in State 3. But, in the more comprehensive world where the whole array of states in Figure 3 is "now", *that "would-have-been" exists indestructible and unalterable.* The same thing holds true of $\underset{n}{N}$ in State 1, this being in causal succession to $\underset{m}{M}$ in the same State 1.

'Now, this immortality of the "would-have-beens" is manifestly of great importance to many people who suppose that they have, by their own foolishness, destroyed them. But that importance is a very minor affair compared to the importance of that survival of the "have-beens" which comes to light when we pass from "now-mark-1" to "now-mark-2". For that step introduced immortality itself as distinct from the alternative complete and lasting destruction of everything.

'Move on now to the next stage—the stage where the past, present and future conditions of Figure 3 prove to be "now" in real time. Here nothing is added to the eternal presence of the "have-beens" and the "would-have-beens" represented in Figure 3. But suppose that, when "now-mark-2" was in association with State 3, you had seized that opportunity to alter the state $\underset{l}{L}$. This would have broken the causal sequence running through $\underset{l}{L}$, $\underset{m}{M}$ and $\underset{n}{N}$, and have substituted an $\underset{m}{M}$ and an $\underset{n}{N}$ in State 1 different from an *earlier* $\underset{m}{M}$ and an *earlier*

N_n. Very well, let us add a State 0 to Figure 3, placing this below State 1 and on the same page. Now, in a *past* condition of Figure 3,—a condition in which "now-mark-2" would be shown in association with State 1,—the earlier M_m and N_n which we are discussing would appear in the State 0 which pertains to the *past* condition of our enlarged Figure 3. But (and this is the important point) they would appear also in the *present* condition of Figure 3. Hence, so far as those earlier "would-have-beens" are concerned, nothing new is brought to light by taking the step which exhibits the past, present and future states of Figure 3 as all really present in real time.

'Would that step bring into view anything additional regarding the future in real time? Well, consider first that future as being represented in State 3 of Figure 3. M_m is assured. It is the M_m which results, let us say, from your supposed alteration of M_m in State 2. You cannot alter it again—"now-mark-1", the facility for altering, is no longer in association therewith—it is transferred to N_n. N_n, also, is the same as the N_n in State 2, which last is a consequence of your interference with M_m in that same state. You may alter it when "now-mark-2" comes into association with State 3. But future interferences by you, who are outside the limited world we are considering in Figure 3, cannot appear as features of the world dealt with in that Figure. All that we can say is that N_n in State 3 is present

when we have taken the step which exhibits *all* Figure 3 as existing in a "now-mark-3", but that its continued existence is not assured. You may alter it when opportunity arrives or you may decide to leave it unaltered. And exhibiting this insecure $\overset{N}{}_{n}$ as present in a more comprehensive "now-mark-4" covering the past, present and future of the contents of Figure 3 cannot make the $\overset{N}{}_{n}$ in question secure from your possible interference when it becomes present also in "now-mark-3" and "now-mark-2" and "now-mark-1".

'So Figure 3, regarded as present in all its parts, brings our chase after reality in physical time to the limit of its practical significance. In that Figure, "now-mark-2" is the only *physical* element which is active; and real time in physics is the time which times that activity. In that Figure, the corner which is both future to "now-mark-2" and to the right of $\overset{M}{}_{m}$ (namely, $\overset{N}{}_{n}$ in State 3) is the only element which is insecure (assuming that "now-mark-1" has *just* left $\overset{M}{}_{m}$). All the remaining states endure, unalterable, in an everlasting "now".

'You will have realized, of course, that, when we limited the array in Figure 3 to the three states $\overset{L}{}_{l}$, $\overset{M}{}_{m}$ and $\overset{N}{}_{n}$ and to States 1, 2 and 3, our action was quite arbitrary and dictated by the advisability of simplicity in the early stages of the argument. The *l*, *m*, *n* sequence of states would be almost negligibly brief compared to the sequence of the environmental states L, M, N. This last goes back to before the dawn of history and continues until the end of the physical world. Moreover, the number of States which would need to be in-

serted below State 1 on the same page would be as numerous as have been the interferences by *other people* before you were born. The States to be inserted above State 3 should be sufficient in number to allow for possible future alterations recording interferences by such other people after you are dead. Such would be the magnitude of a properly drafted Figure 3.'

Materialist. 'But this. . . . No, there *must* be a "catch" in it somewhere.'

Serialist. 'There is no "catch". Assuming that you think of the physical world as changing, you will find that to think of it in its future or past states is to think of each of those states, not as remaining future or having been always past (that would be ridiculous), but as being *first* future, *thereafter* present and *thereafter* past. The future states *become* the past states. That is the *meaning* of "future" and "past"—in a changing world. But there is a vast sequence of these states, each of which undergoes those changes. That sequence of states cannot represent *the change of each state in the sequence from a future to a past condition*, and so, cannot represent a succession of events in real time. The rest, as you saw, follows.'

Materialist. 'There is something else that puzzles me. It would appear that every one who accepts your arguments will have to agree that there are grades of "*existence*", increasing in profundity, and that those are *relative to* the various "now-marks". How can that be true? Surely a thing either does or does not exist?'

Serialist. 'Ah! Now you are talking metaphysics, and you have raised a question which metaphysicians appear to have neglected to follow up.

'There is a vast difference between "being" and "existence"—a difference which seems to have been noticed first by the early Greek philosophers. Suppose that you say: "This

is." That, strictly, is saying, not: "This exists", but: "This has Being." It is, you will note, the very *least* that you can say about the subject of your discussion. You will see, also, that this bare "Being" is not—in that terse but complete sentence —treated as *dependent* upon anything whatsoever. Consider, for example: "The World *is*." It is utterly inexplicable that there should "be" anything at all. The only fact that could completely satisfy our thirst for explanation would be the fact (if one could call it a "fact") that there was *nothing*! But we have to put up with what "is", however miraculous it may appear; and so we say—"The World *is*." This inexplicable "Being" (as I said in the first paragraph of this *Introduction*) recedes in that series of steps which is called commonly a "regress", and I shall try to show how this occurs.

'The assertion that the World *is* suggests that the sentence would bear lengthening. "The World is . . ."; well, *what* is it? Let us suppose that you try to answer that question by defining the *kind* of Being which the World possesses. Such *defined* Being is limited Being. It is being which has to satisfy some restricting "criterion" which you have in mind. Such restricted Being is not independent. It is dependent upon the selected criterion. Such limited, relative Being is what metaphysicians mean by "existence".

'The "existent" is a particular *characteristic in*, or, more properly, *character of*, that to which you attributed Being.

'You remember that on page 18 we agreed to show L, M and N as successive states of your environment without implying any spatial relation between those states; but you discovered that you picked out M as the present state. This character, the "now-ness" of M, conforms to the restricting criterion which you have in mind as characterizing what is present. It is therefore an "existent", and we shall improve upon Figure 2 by placing in a separate compartment which

we shall call A.1., what you abstract from A.2. because of the "now-ness" of it, namely, M.'

FIGURE 4

A.1.					
	M				
A.2.			B.1.		
L	M	N	( )		
A.3.			B.2.		C.1.
L	M	N		( )	
L	M	N		( )	[ ]
L	M	N	( )		

'All of the realities shown must be said to "be"; but, in the view of "now-mark-1", labelled B.1., M has the more limited and definite character of "existence". On page 111 of *The Serial Universe*, 1942 edition, the equally real "existences" of different views taken all at the same moment but within an expanding series of "now-marks", are shown in a more extended table.'

Materialist. 'Of course, if each of us is in fact not one observer but a series of observers, we may be aware of a series of what philosophers may call "existents" appertaining to the observed world. But I am aware of being only one individual; and when I make an experiment, I must, of course, notice the difference between time and space. So I would like to know why in referring to the physical states L, M and N, you speak as if I ought to recognize in their sequence a spatial relation between them.'

Serialist. 'Perhaps the first two rows of entries that we now have in the table (Figure 4) will help to explain.'

Materialist. 'I wonder. I may as well say that I insist on words carrying their precise meaning.'

Serialist. 'You are departing from your proper *role.* However, I can give you something "on account"—something which the average reader will be able to understand. But it will involve considering the earlier factors in our argument, which we have embodied in Figure 4. The curved brackets shown in the compartment labelled B.1. have changed from association with state L in A.2. to association with state M in A.2., and are about to change again, to association with N in A.2. The alphabetical order of L, M and N alone, without any factor representing space, denotes which state is "earlier" and which "later" in the A.2. sequence. But we had agreed (see pages 23 and 24) that the "now-mark-1", labelled B.1., and the three A.2. states were realities, and that it was the successive coincidences of the physical "now-mark-1" with the physical states in A.2. which constituted the real events in real time.

'Consider, then, that, at the instant shown in Figure 4, (page 36) a stone is falling from the top of the Leaning Tower of Pisa. Throughout its journey it remains in three-dimensional space, and it traces a path in that space. But the path traced is no more than a *path*: the stone itself is always at one point only in that path.

'Pass on now to the consideration of the A.2. sequence. Let us say that L represents the state when the stone was at the beginning of the path which it is tracing in three-dimensional space, that M represents the state where it is somewhere between the beginning and end of that path, and that N represents the state when the stone will be at the end of that path—striking the ground.

'Now, that *path* is *continuous.* There are no gaps in it.

'Therefore a complete A.2. sequence showing between L and N *all* the past, present and future states of the falling stone must form a *continuous line* running fourth-dimension-

ally from L to N. And *that* line will be no mere path. The falling stone, in one of its past, present or future states is at *every* point in that line. So the line is the stone itself extended in the fourth-dimension. It is what the Relativists call, a "world-line".

'Nevertheless, there is, in this second row of the table, a three-dimensional space in which the falling stone remains throughout its journey, although never occupying more than one point in an otherwise empty path. "Now-mark-1", three-dimensional, is *travelling* along the fourth dimension from L to N. It is symbolized in the table as B.1. So the falling stone must be appearing therein as a small object (a cross-section of its world-line) continuously present but occupying only one changing place in its otherwise empty path at each successive instant of real time.

'Neither you nor the reader, then, will go wrong (although you will not go far enough) if you think of "now-mark-1" as what physicists call, a "field". It will be, of course, a field capable of conveying energy from you, outside the table, to your brain in A.2.; since it is your "facility for interference".

'So there is your four-dimensional world, regarded as a reality and not merely as a geometrical way of treating endurances, as is the case in a hospital nurse's temperature chart or a written musical score. Your physical world; your body; and your brain: all these are *at least* four-dimensional. And the same must hold true of that *you* outside the table to whom at least everything in A.2. is existing.

'You will notice that, in arriving at this four-dimensional world, you have, so to say, "by-passed" Relativity. You have acted alone: no other "observer" has been called in to assist. And the result has been all to the good. Your four-dimensional world is positive and unambiguous.'

(It might be as well for me to break off the duologue at this

point in order to explain to a possibly non-comprehending reader what precisely is meant by the 'fourth-dimension' in modern physics, restricting this to its simplest form. Standing erect, you can move 'backward or forward' without moving 'up or down' or 'sideways'. 'Backward or forward' is a space dimension: 'up or down' is another: 'sideways' is a third. You can move also 'up or down' without moving 'backward or forward' or 'sideways'. Again, you can move 'sideways' without moving 'up or down' or 'backward or forward'. But you will find no fourth way in which you can move without moving either 'backwards or forwards' or 'sideways' or 'up or down'. The fourth dimension of modern science is not a fourth way in which you can move your body—the reason being it is a dimension of *endurance*, so that your body is *extended* therein. It has been regarded (mistakenly, according to Serialism) as a dimension of *real time*. Serialism shows that it is illegitimate to regard your body as extending in this dimension unless you take into account that a 'now-mark-1', marking off successive three-dimensional sections of that body, is travelling along that dimension. Real time measures the speed of that travelling, and, according to this theory, the speed in question is the speed of light.

Finally, the physical world extended in this fourth dimension exhibits the characteristics needed to enable it to play its part in the production of apparent 'events' in three-dimensional space as the travelling 'now-mark-1' passes along it. And that involves a cause-and-effect sequence (represented by our alphabetical order) running in the direction in which the 'now-mark-1' is travelling.

And now, let us get back to the discussion.)

**Serialist.* (continuing). 'I should like to show you now how

* Sections between the asterisks on pp. 39–42 would probably have been re-written (see p. 3 of Introductory Note).

greatly the Serialist's Table is simplified by the discovery that the contents of A.2. are "world-lines"—belts of little width in their three-dimensional cross-sections but of comparatively immense length in that fourth-dimensional extension which you mistook for real time.

'The Table composed of alphabetical letters and bracket "now-marks" is a very cumbersome thing. Even if we cut out L M N and confine ourselves to the brain states *l m n*, we have arrived at the diagram below:

FIGURE 5

State 3	*l*	*m*	(*n*)
[State 2	*l*	(*m*)	*n*]
State 1	(*l*)	*m*	*n*

'You will realize that "now-mark-1", in travelling along the fourth dimension from *l* to *n*, remains in existence throughout its journey. Glancing at Figure 5, you will note that this "remaining in existence" means that "now-mark-1", throughout its journey, remains within the upward-travelling "now-mark-2". And that means that "now-mark-1's" path is from *l* in State 1 to *n* in State 3. But Figure 5 is "now-mark-3", and, in that "now-mark-3", our "now-mark-1" exists in all parts of the diagonal path in question. Hence, the diagonal path is really the world-line of "now-mark-1". Therefore, that dimension of Figure 5 which stretches up-and-down the page represents a *fifth* dimension up which "now-mark-2" is travelling.

'Now, this discovery of a series of existing worlds of increasing numbers of dimensions is the logical consequence of the physicist's attempt to describe a world which can be regarded as observable, testable by experiment, and yet pos-

sessed of independent being. Such a world, as Serialism proves, is bound to be regressive—the property of "independent being" regressing and leaving behind in the process a series of worlds which are merely abstracted *characters* existing relatively to some observer or group of observers. But each of this series of abstracted worlds has its own appropriate "endurance" dimension. So it is quite correct to speak of the fourth dimension as "Time-1", the fifth as "Time-2", and so on. This Serialism has done since its first appearance in the pages of *An Experiment with Time* published in 1927.

'We are now in a position to treat the side-to-side dimension of Figure 5 as representing the fourth dimension, and the up-and-down dimension as representing the fifth dimension. Clearly, we can substitute world-lines for each horizontal *l*, *m* and *n*, and a diagonal world-line for the diagonal (*l*), (*m*) and (*n*). When we have done this we can see that the three verticals (*l*) *l l*, *m* (*m*) *m*, and *n n* (*n*) must be, also, world-lines—in fifth-dimensional time-2. So the result will be this:

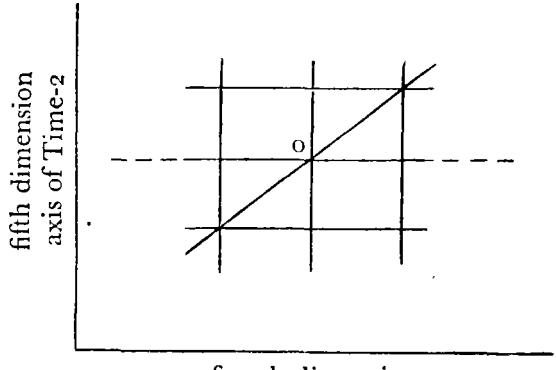


FIGURE 6

'The dotted extensions at each end of the middle hori-

zontal line show where "now-mark-2" (represented now by a horizontal line) becomes superposed upon the underlying world-line which was State 2, *l* (*m*) *n*. The Figure is, again, an instantaneous view, at the instant when "now-mark-2" has reached the position shown in its travel straight up Time-2. The point o is an important feature in this Figure. It represents the point where the travelling "now-mark-2" intersects the diagonal world-line of "now-mark-1". It is clear that, when "now-mark-2" travels up time-2, this intersection-point o will travel from left to right along "now-mark-2". It is *the only place where you—outside the Figure—can interfere*, and the only place where you can experience that unpleasant *intensity* in sensations I spoke of earlier. Hence, it merits an entirely distinctive title, and o has been chosen for that.

'"Ordinary" space, three-dimensional, does not appear in this Figure; but you can imagine it as sticking out perpendicular to the page.*

'The tabular analysis of this Figure is extremely simple. Here it is: compare it with the one in Figure 4, on page 36.

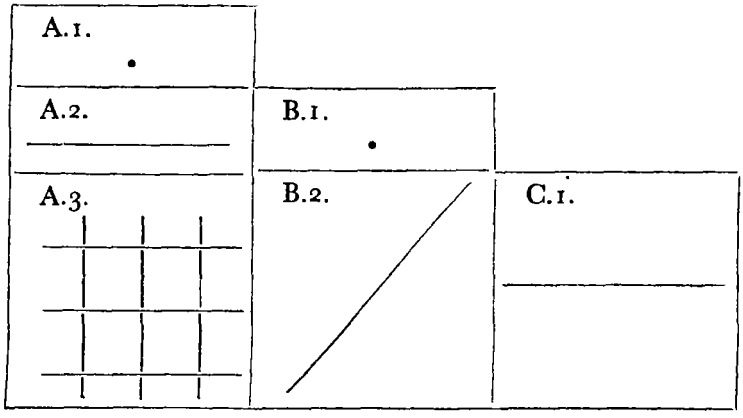


FIGURE 7

'Notice that, as in Figure 4, we have: C.1. is abstracting B.1. from B.2., and A.2. from A.3.; while B.1. is abstracting A.1. from A.2. Now, the criterion which abstracts must possess at least one character similar to the character which it abstracts. C.1. must contain a character similar to A.2., and another similar to B.1. (This last character is, of course, C.1.'s cross-section.) B.1., in turn, must possess one character similar to A.1.

'There is a very important point to be noted with regard to the development of this table.

'Consider Row 1, the top row, as being the only Row in the table. It consists of a single compartment, the supposed contents of which are symbolized by A.1.

'Let A.1. represent a real, active, three-dimensional world. It is changing its states. To simplify matters, let us consider that the world in question contains a body moving with uniform speed in one of the three dimensions of ordinary space. The changing states of this world amount to simply the changing positions of the moving body.

'Let one of these states be the *present* state. The A.1. world in that state is real, whereas that world in its past and future states *may* be merely imaginary and unreal. In its *present* state that world can be *altered* by an observer for experimental purposes. Alteration of the present state will alter the future states, imaginary or otherwise; but the past states, imaginary or otherwise, are unalterable.

'We choose, now, one dimension of our paper to represent a dimension of the space of the A.1. world, and we say that the other dimension represents a fourth dimension, or time-1. One dimension of space suffices for the path of the moving body, and another space dimension may be thought of as sticking out perpendicular to the paper. The third dimension of space must be imagined as present in the diagram

although, of course, it cannot be shown. The diagram is to be regarded, thus, as drawn in a four-dimensional continuum.

'We proceed, now, to map out in time-1 a sequence consisting of (1) a number of past states of A.1.; (2) the single, real, present state of A.1.; and (3) a number of future states of A.1. Each state will be, of course, a three-dimensional cross-section of the four-dimensional world.

'This proceeding is called, "*extrapolating in time*". That which is "*extrapolated*" in this case is the three-dimensional A.1. world, and the time-1 sequence of states is the "*extrapolation*" of A.1. We label it, A.2., and enter it in a compartment in the second row of the table. In that extrapolation the moving body of A.1. becomes, as we saw earlier, a "world-line" in the four-dimensional world. The world-line will be curved, because the moving body is accelerating.

'Every extrapolation in time is a *constructed* thing. You are not *discovering* that the world is four-dimensional: you are *making* it so. Except for the single, present, real state in the middle, your A.2. array of states is an *imagined* extension in a purely imagined fourth dimension.

'Now, the A.1. world is *changing* its states. Those changes are the only *events* in real time that we have, so far, discovered. But the A.2. extrapolation is not a representation of those *changes*. It is merely a list—a list consisting of past states of A.1. which have been *changed from*, the single, real, present state of A.1., and future states of A.1. which will be *changed to*. To employ that list in a representation of real time we need to indicate changes in which the present state in the list becomes a past state, and a future state in the list becomes the new present state. We need, in brief, to have a "now-mark" *travelling* fourth-dimensionally along A.2. and indicating that each future state in A.2. becomes in its turn the single, real,

present state, assailable for experimental purposes, and, thereafter, becomes a past state.

'We cannot say that A.1. in Row 1 is this travelling determinant of the "now". For A.1. cannot be thought-of *as travelling over its own extrapolation as* A.2. That would be to indulge in a "vicious circle"—to think of a proceeding analogous to that of a coiled rope travelling over its own uncoiled length!

'What, then, is this travelling determinator of the "now", this thing which makes the states in A.2. present, real and *alterable for experimental purposes* singly in succession?

'Well, hark back to our starting point! The A.1. world is present—to the *observer* thereof. It changes to another state, but it still remains present—to that same observer. Its past states have gone out of existence—in the opinion of that same observer. Its future states have not yet come into existence—says that observer, and the state which is present—to that same observer—is the state which is alterable, for experimental purposes,—by that same observer! Obviously that alterable state is marked out for you by "now-mark-1" 'i.e. by a real B.1. travelling over a real A.2. You made that discovery when you added B.1. to Row 2, acting under compulsion.

'B.1. does not travel over an A.2. which is an imaginary extrapolation of A.1. It travels over a real, existing A.2. which is not an extrapolation. So, the growing record A.1., which is a product of B.1.'s successive coincidings with the cross-sectional states of the real A.2., is travelling with B.1. over that same, real, not-extrapolated A.2. It is not, therefore, travelling over its own extrapolation.

'A.1. in Row 1 is an abstraction. Row 2 has become the world of realities. Now, that which abstracts is an intelligent being employing something as a criterion. B.1. is merely a

space: it is not an intelligent thing. It might travel over A.2. for a century, but it would abstract nothing on its own account.

'The abstractor is *you*, employing B.1. as a criterion (or abstracting agent). And the you who abstracts the "growing record" A.1. is the you who has not yet entered the table. At this stage of the regress, where the real world is Row 2, the abstracting "you" is Observer-2, possessing the four-dimensional character of C.1 not yet in the table.

'When we bring in Row 3, the abstractor of A.2. from A.3. will be you, outside the table, employing the criterion or abstracting agent C.1.

'So the real "you" regresses.'

Materialist. 'Well, I can see no answer to all that. But here is something which seems to require a little more explaining. To begin with, suppose that "I"—outside the table—am ignoring my knowledge of what is presented to me by "now-mark-3". That would be knowledge of A.3. But suppose also that I am utilizing fully my knowledge of what is presented to me by "now-mark-2" or C.1. That will be knowledge of A.2. Now, according to what you said on page 27. I, employing any "now-mark", am afforded a "view" of whatever it is that the "now-mark" is rendering present and existing. In other words, I am "observing" what the "now-mark" covers. So, on our present supposition, I, five-dimensional, outside the table, shall be "observing" whatever is presented to me in A.2. by C.1.'

Serialist. 'Yes.'

Materialist. 'But how can that be? Consider the part of A.2. which is "*past*" in time-1—past and enduring for all eternity. It is, in Figure 7, a static world-line. No *energy* is passing anywhere from that world-line to the corresponding part of the four-dimensional C.1. How, then, can that part of C.1. be

"observing" that part of A.2. How can I, viewing C.1., obtain thereby a view of that part of A.2.?'

Serialist. 'I am glad that you have put that question at last. The answer may be a little beyond the comprehension of the general reader; but you will be able to assure him that it is correct.

'I agree entirely that no energy is passing anywhere between the two world-lines you have cited: namely, the time-1 "past" of A.2. and the corresponding four-dimensional bit of C.1. But remember, please, the definition of physical "observation" to which we agreed on page 15. It is the *conforming of the observing element to the element which is restricting its freedom.* And I must remind you that physics lays great stress upon one kind of conforming which is precisely of the static character which you are considering. In this conforming, what is taken into account is a fundamental physical quantity called "Action". It consists of Energy multiplied by Time. The conforming to restriction here may be described as the way in which the observing element has its position, *throughout a period of time,* affected by the presence, *throughout that same period of time,* of the element observed. This conforming is governed by what is known as "The Principle of Least Action". And, in the phraseology of that Principle, what is meant by "Time" is simply a sequence of states which can be, and often is, represented graphically by the A.2. sequence we are considering. The world-line in the bit of C.1. which we are taking into account is conforming, from end to end of its four-dimensional length, to the presence of the corresponding world-line in the time-1 "past" part of A.2. In other words, each of the two world-lines has the physical character of Action, and the Action of each is dependent upon the Action of the other in such a way that the combined Action of the pair is the least possible in the circumstances.'

Materialist. 'Yes, that seems to be the correct answer. Very well, I agree that any argument based upon a supposed difference of duration in real time between my brain and its environment is invalid. That difference turns out to be merely in the respective *lengths* of four-dimensional world-lines, all of which have the same endurance in real time. It is a pity; because that argument was one which many earnest extinction-seekers have found very comforting.'

Serialist. 'Ah yes! Of course. Very sad. But really, you know, they have no need to worry. None survive in the crude fashion in which these folk are afraid of surviving. Even that most deep-seated of all human desires—*the desire for escape from the remembered self*—does not require for its satisfaction the loss of experience of the known world.'

Materialist. 'Are you going to explain how you arrive at that?'

Serialist. 'Yes, but not in this *Introduction.* Here I am dealing merely with the physical world as it appears from only one point of view—yours. But in the second chapter of the book proper I am going to tackle—in a new fashion—the external world as it is related to more than one observer. When you have read that and have skimmed through the last two chapters of *Nothing Dies*, you will, I hope, appreciate very fully what your immortality promises in the way of freedom from the trammels of time and escape from the dreariness of self.'

Materialist. 'Very well, I have promised to read those two chapters. But now, please, answer my question. What *is* "now-mark-1"?'

Serialist. 'But we went into all that before; when I introduced the falling-stone illustration to show you that "now-mark-1" is a three-dimensional *space* travelling through the four-dimensional world. Since that is a conception which is beyond the average reader's comprehension, I said (see page

38) that neither he nor you would go wrong (although you would not go far enough) if you thought of this travelling space as what physicists call, a "field".'

Materialist. 'Yes, I know that; but what are its physical characteristics? Surely you can see the importance of the question. The three-dimensional space in question extends far beyond that world-line of brain which you are considering in the present table. And physics is very much concerned to discover what, precisely, *are* its characteristics. If you can throw any light, however small, upon that problem, you have no right to keep the knowledge to yourself merely because the readers for whom you are writing may not be able to understand it.'

Serialist. 'I have no intention of keeping it to myself. But surely you must see that a new light, however small, on the problems of physics is not a thing which can be presented first as merely part of an *Introduction* to a popular book. That, simply, isn't done. Even the most tolerant of physicists would resent a discourtesy like that.'

Materialist. 'I can see that I must indulge myself in a little plain speaking. A new theory of *time* is something which must affect physicists, philosophers, psychologists, biologists, theologians and even psychical researchers. Presumably, you have perceived this. But what, obviously, you have not realized completely is that you are obliged to present your case to all these people simultaneously. Every explanation which you give to the exponent of one of these six "disciplines" must raise questions in the other five directions—questions which you cannot afford to leave unanswered. Now, each of the disciplines in question is represented by some Society with its own private channels of approach, isolated expressly from the channels belonging to the others. Consequently, the necessary simultaneous approach can be effected only by means of

a book. And that means giving dire offence to the whole lot of them.'

Serialist. 'But I think I have realized that, though not perhaps as clearly as you have shown me.'

Materialist. 'It may be so. But what you have failed to grasp is that you cannot *plan* such a book. It is bound to branch off in unexpected directions. Look at the way in which you have left Joan of Arc burning eternally at the stake—and *feeling* it, for all that you can prove to the contrary. Oh! I know that you claimed vaguely that acute intensity of sensation is present only in the limited field of view apparent to B.1. But *intensity* in sensation has a *physical* counterpart, and intensity in physics is energy divided by time. Presumbly, you intended this *Introduction* to be something comprehensible to the general reader. You were wrong. Show me, please, why energy divided by time is greater in the view apparent to B.1. than it is anywhere else in A.2. Or do you propose to make that assertion to the general reader without attempting to justify it before an expert? Show me wherein lies that claimed peculiarity of "now-mark-1". The general reader can wait.'

Serialist. 'I see. Yes, I see. Very well—let us start with something that the general reader can understand, and ascertain how far that will take us.

'You will note, please, that I did not, throughout the foregoing pages, demand that you explain the problem of "sense data". In that respect I allowed you to remain as "monist" (in the materialist sense) as you pleased. I eschewed psychology and psychological evidence. I abandoned every weapon upon which your opponents are accustomed to rely. Never before have you been allowed so clean-swept a field in which to deploy your theories. And the upshot was that you were compelled to discover for yourself a *Mind* which is something

more than brain-working and which can never be brought into any tabulation of physical quantities.

'In short, I gave you the longest rope you have ever had—and you hanged yourself. I allowed you to bring forward every one of the pernicious fallacies with which you have gulled mankind throughout the last few, disastrous generations—fallacies which have driven philosophers frantic with impotent indignation—and I have swept the whole lot into the limbo of dead horrors. In compensation, I have shown you that you are a serial and, so, "self-conscious" being, possessed of serial views of widening scope over a serial world of inconceivable richness. And I have shown that you and that world are immortal in a fashion which you had never even suspected. Above all, I have convinced you that *every* scientific experiment is experimental proof of the validity of those logical discoveries.'

Materialist. 'But why this very un-socratic warmth? Are you annoyed?'

Serialist. 'I have every right to be annoyed. You are trying, deliberately, to spoil the plan of my book.'

Materialist. 'Oh! no. I pointed out merely that you had spoiled the plan, already, yourself. You may as well be hanged for a sheep as for a lamb.'

Serialist. 'If you knew what was coming in this book, you would realize that I shall be hanged irrespective of any offence I may or may not give in this *Introduction.* But I prefer to go to the scaffold by the path I have planned. However, I have not finished what I was saying—to the general reader as well as to you.

'You grasp now that the travelling B.1. space is abstracting from the A.2. world a different cross-sectional space at each instant of real time?'

Materialist. 'Yes.'

Serialist. 'Very well. Your initial problem was to extrapolate, from the changing contents of B.1.'s view (A.1.) of A.2., a static four-dimensional world of past, present and future states of that A.1. But it would not suffice to take merely a single snapshot-photograph of the present state of B.1.'s view. You could not possibly extrapolate a world-line from that. Consider our falling stone (see page 37). This, we discovered, was moving in the three-dimensional, present space, B.1. To simplify the problem, let us substitute for that stone some small body moving at a speed which turns out to be constant. (as we did before on page 43). One "snapshot" shows you only where it is now. To extrapolate its world-line you have to discover in what *direction* and at what *speed* the body is moving in the three-dimensional present space. To discover that, you have to take a second photograph at a later instant of real time, measuring the time-interval by your watch. Then, when you have extrapolated the static world-line of the body in question, and have converted the changing contents of B.1.'s view into a sequence of static cross-sections travelled-over by the single, present B.1. space, that travelling B.1. space will have been a space measuring *displacements*. It will be, that is to say, a space in which the moving body has occupied, successively, more than one recorded *position*. But no three-dimensional cross-section of the static A.2. extension can indicate more than *one* position of the body in question. You can see that easily enough if you draw an inclined world-line, like *ab* in Figure 8 on page 53, and then place a table-knife blade on its edge along the line B.1. Move the knife edge to the right in the direction of the arrows, and you will see that the point o, where the world-line *ab* is intersected by the knife-edge, moves up the blade edge, so that, *within* the three-dimensional space represented by that edge, you can observe a number of different cross-sections of the world-line,

each of which represents a position of the body in three-dimensional space. In the knife-blade-space, you can, thus, observe *displacements* of the body *within* that space. But no parallel three-dimensional cross-section of A.2. such as is indicated by the stationary dotted line drawn on the left of the Figure, or such as could be represented by a similar stationary dotted line underlying B.1., can contain more than *one* position of the body.'

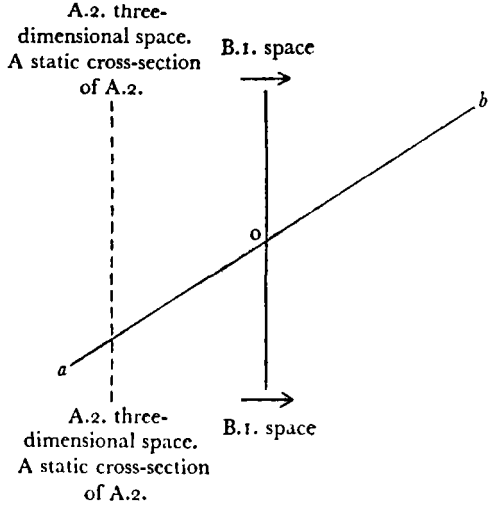


FIGURE 8

Materialist. 'That is perfectly clear. I cannot see what has been worrying you. Any reader could grasp that the two kinds of space, B.1. and the cross-section of A.2., are different.'

Serialist. 'You realize, of course, that the knife-blade B.1. space is not *identical with* whichever of the A.2. cross-sectional spaces it happens to be abstracting. Moreover, it abstracts

from A.2. such similarities in character as are common to both—but nothing more.'

Materialist. 'Yes. But look here! Can I not avoid thinking of past and future states of the A.1. world, and confine myself to thinking of that world in its present state only?'

Serialist. 'Surely we do not need to go over all that again. Our experiment compelled you to take those past and future states into consideration. It consists, you will remember, in making any ordinary scientific experiment. Every such experiment involves planning. You decide that you will make such and such an interference with your brain's environment as soon as an *anticipated* state of that environment becomes the present state. Or you may regret that you did not effect that interference when the environment was in a more favourable state which is now "past". (Note, by the way, the beautiful introduction of the second-term "now" in that expression "now past".) You did your best to avoid thinking of those realized time-1 "past" and "future" states as being spatially extrapolated in a fourth dimension—that was the underlying aim of your L, M, N device. But our dodge of considering a body moving uniformly in a present space (the B.1. space) knocked that hope on the head. We may say that, whenever you found yourself obliged to think of the time-1 "past" and "future" states of the A.1. changing world, you were performing, unconsciously, a mental extrapolation which might have agreed with the real fourth-dimensional world belonging to the A.2. compartment. But it is highly improbable that there was complete agreement.

Materialist. 'I do not follow that.'

Serialist. 'Look at Figure 7 (page 42), and remember that, to you as the four-dimensional C.1., outside the table, the B.1. space is travelling along the true A.2. fourth-dimensional extension. To get, from what you perceive in B.1. only, an

extrapolation in agreement with the *perceived-as-existing* four-dimensional A.2., you have to make allowance for the difference between the travelling B.1. space and the space it happens to be abstracting from the A.2. sequence of cross-sectional spaces.'

Materialist. 'But you have just been showing me how to do that. The difference is that the B.1. space can be used to exhibit *displacements* of the three-dimensional body *within* that space. No cross-sectional space in A.2. can serve that purpose.'

Serialist. 'I did not show you enough.'

Materialist. 'Very well, show me what remains to be shown!'

Serialist. 'You will find it in the *Appendix* at the end of the book, together with the rest of the physics you require.'

Materialist. 'In the . . . what? But, my dear fellow! You cannot relegate the discussion of entirely new physical problems to the *Appendix* of a popular book!'

Serialist. 'I can.'

Materialist. 'I mean: you dare not!'

Serialist. 'It is much too lengthy to bring in here. And you said yourself, a little way back, that one may as well be hanged for a sheep as for a lamb. In that proverb no limit is assigned to the size of the sheep.

'But do you not see that we have been losing our sense of proportion? Let us mix our metaphors and admit that, if there is any hanging to be done, it will be only from the yard-arm of some ship sailing troubled waters in a tea-cup!

'So—that being the case—"Hats over the Windmill", my lad! and come along with me!'

CHAPTER I

Dear X,

The best and easiest introduction to Serialism is, I think, my little popular book called *Nothing Dies*. This, I gather, you have not read. You tell me, however, that you have gone through *An Experiment with Time* and *The New Immortality*; so I need not devote much space to reminding you of the vitally important place which is occupied in any rational philosophy by what is called 'the evidence of the senses'. That this evidence is notoriously unreliable is immaterial; the point being that what none can deny is the existence of the *evidence*. We reach, in sensory experience, an undeniable *residuum* which we call the 'sense datum'.

Lights, colours, pains, tastes, smells, sounds: these are *sensory* elements. All of them have their physical counterparts in the behaviour of nervous matter. But those physical counterparts are only—*counterparts*. Particles—little lumps possessing no other property than that of inertia—cannot, simply by moving about, create *redness*. Such an agitation may produce an 'illusion' of form, but it cannot make that illusion *red*. To talk of a *blue* movement or *pink* movement would be to indulge in gibberish. Length, endurance, electric charge, magnetic pole, mass, pressure, 'force at a distance', space curvature—no combination of these can create redness. No structure—not even group-structure—can create redness. Once anyone has grasped that fact, it will dawn upon him that all the sensory elements referred to above are essentially non-

physical. (See the first chapter of *An Experiment with Time.*) They are called sense 'data' because 'data' means 'things given'; and these things are given in the sense that they are not describable in words, not explicable by knowledge of another kind, and yet exist in a quite undeniable fashion.

They are all restricted in time and space. Science has no difficulty in showing that these observable temporal and spatial limitations are shared by their physical counterparts (commonly called 'neural correlates'). That fact is the basis of the agreement which was arrived at finally between the Idealists and the Materialists. Both parties accepted what is known as '*Psycho-neural Parallelism*', which means merely that the sense datum (the 'psychosis') has no existence apart from an accompanying condition of the nervous system (the 'neurosis'). In this matter the Idealists had no more choice than the Materialists; for, while no organization of the elements recognized by physics can create redness, it is equally clear that redness alone cannot create an eye and an optic nerve.

It was a piece of sheer good luck which led me to begin my own studies of psychology by reading the monumental treatise written by Professor James Ward for the *Encyclopædia Britannica* of 1885 and embodied afterwards in his book *Psychological Principles.* In the course of that article, he sums up the results of two centuries of careful work conducted by a series of extremely able experimenters. The methods of these men were 'extrospective' rather than 'introspective'; that is to say, they treated the sensory presentations as observable objects. For example: they would not speak of a 'remembered' impression (with 'remembering' regarded as some semi-mystical 'faculty' with which the experiencer of the impression is endowed); but would recognize that 'remembering' is the observation of a present and perfectly observable "memory-image", the means for the production

of this being an after-effect of the observing of the original presented sense datum. This observational method proved a most potent instrument of discovery. It brought to light a complete structural system of 'generic images' and simple 'memory images' linked together in an 'associational network' all parts of which are present and observable. The means for the production of this plexus of images appear to be after-effects of observing (a) the original sense data, and (b) the more directly related 'memory images' aforesaid. It is this associational network which is employed in all those 'trains of ideas' which are apparent in 'mind-wandering'—a fact which any reader can test, observationally, for himself. (See Chapter V of *An Experiment with Time*). These discoveries were of assistance in establishing brain as a physical structure employed in 'thinking'. In that connection I owe much to other psychologists (notably McDougall). But it is only the 'whole-hogger' materialists who regard the production of the equipment for thinking as an entirely mechanical process consequent upon the receipt, by the brain, of stimulations from the outer world. Ward believed the Mind played a major part in the process. McDougall assigned it a smaller role. Bertrand Russell (the third of the authors I studied) was clearly no materialist.

The attitude of the modern 'psycho-analysts' defies most people's understanding. But there is one point I had best make clear. If we compare any structure of the imagination to a house, classical psychology (the psychology I have been describing) shows *whence* we obtain the *bricks* and *how* association presents them to the builder for his choice in usage. Psycho-analysis shows—or claims to show—*why* the imaginer decides to build that particular edifice. There is no overlapping here; and modern psycho-analysis no more supersedes classical psychology than the study of sanitary engineering

supersedes hydrodynamics. If you wanted to understand how eddies come into being, you would hardly be satisfied with the perfectly true statement that an eddy occurs when someone pulls a chain.

In what I have to say in this correspondence, there will be no need to draw distinctions between 'Impressions', and 'Images'; and I shall employ the expression 'sense data' to cover all phenomena which, though paralleled by brain conditions, cannot be regarded as the *creations* of brain.

My debt to James Ward and his multitude of forerunners includes, however, something of far greater utility than an insight into the machinery of imagining. They awakened me to the overwhelming importance, in all mental operations, of that concentration of observation which is known as 'Attention'. Since 'Attention' plays a leading role in the world discovered by Serialism, I am obliged always to make sure that my readers are aware from the outset of the remarkable effect that attention can produce. The same difficulty confronts me here. Other persons than you may read these pages; and it would not be safe to assume that they are equally well grounded in this subject. So, here goes—but I shall try to be brief.

You are reading this book, and your focus of *vision* is concentrated upon the printed forms of the words you are regarding. But your focus of *attention* is on the *meanings* of those words. At the same time, you are having a host of sense data presented to you for attention. If you are holding this book, the sense datum of its pressure upon your fingers must be present, and you will notice it now that your attention is directed thereto. But, before that, *it was to you almost as if that sense datum had no existence.* Yet it was there. If your fingers had lost suddenly all sense of feeling, you would have missed, at once, the sense datum to which you were not attending.

The experienced intensity of a sense datum depends partly

upon degree of concentration of attention. The soldier in battle, intent upon killing his enemy, often does not know that he has been wounded. You are unaware of toothache when you are running a race.

Ward writes: 'A whole swarm of meteors might have streaked the sky unheeded while Ulysses, life in hand, steered between Scylla and Charybdis.'

You will realize, therefore, I hope, that acute concentration of attention dulls almost to the point of obliteration the contents of the remaining and greater part of your field of observation; not by reducing its area but by rendering those contents unnoticed.

Now, since you can direct attention to or withold attention from, sense data, you must be *observing* them; for degree of attention is degree of concentration of observation. We might add to that proof the discoverable fact that you are something which can adopt definite attitudes towards these phenomena. You can study them: you can compare any two of the same class: if you are an artist you can pick out the proportions of blue and yellow in a green hue. Clearly, then, you are not a mere conglomeration of such physical (i.e. mental) phenomena as sights and sounds and pains and smells and pressures and tastes: you are an *observer* of these sense data. But physical things, reacting only to physical things, cannot observe sense data: they can observe only the neural correlates of these. So you, in your capacity of the observer of sense data, must be a psychical observer. This gives us a starting definition for what we may call, 'Mind'. Mind is that which observes and attends-to sense data.

Neurologists have not yet discovered any neural counterpart to this Observer of sense data; but if such a physical parallel is discovered, it will be something which observes those brain conditions which are the neural correlates of the

sense data, and it will leave us still with Mind as the Observer of the sense data themselves.

The neural correlate of a sense datum is a flow of nervous energy enduring (in time-1) for not less than a certain period. This is a very peculiar fact. With a fixed quantity of energy flowing, the shorter the time into which the flow is condensed, the greater is the intensity of the sense datum. But, if you reduce the time of flow below a certain minimum, then, no matter how great be the amount of energy flowing, *no sense datum appears.* This means that the neural correlates of sense data are, at least, four-dimensional. For energy multiplied by time-1 is the four-dimensional 'Action' referred-to in the Introduction.

You are the Observer of your own private sense data, and the foregoing paragraph asserts that the neural correlates of what you observe are *stretches* of the world-line of your brain —stretches which must be, of course, in the condition appropriate to the appearing of sense data. In other words, sense data are four-dimensional objects, and you, as their Observer, are Observer-2.

Consider now the bundle of world-lines which is your brain. *Wherever* a sufficiently long bit of that stretch is in the condition associated with the appearance of sense data, you, Observer-2, possessing mind, can find sense data to engage your attention. The position of the time-1 'now' does not affect that question. This was proved in all my books, the original proof being in *An Experiment with Time.* It was proved also that your attention can be focused upon any place in the whole length of your brain's world line, quite regardless of where the travelling 'now' may be. If, however, your attention follows that 'now' you will find that the sense data at that place have an intensity far in excess of that which pertains to the sense data observable elsewhere. This is because '*energy*', a

physical thing, passes at the 'now' from brain to mind whenever sense data are apparent at the place in question. Intensity is associated with energy. Mind has, therefore, a physical side. Energy, however, can flow either way in the travelling field, and it was shown in *An Experiment with Time* and *The Serial Universe* that Observer-2 can intervene at the 'now' to affect the brain—alter some of its world-lines at that point. There should be nothing startling in that statement: it is only a clear-cut confirmation of what almost every doctor maintains—that the mind can affect the body. Now, an added intensity to some sense data renders them extremely unpleasant. This is especially so in the case of the sense datum known as 'pain'. But all elementary living creatures which can observe sense data *have a view of the less intense sense data lying ahead of the 'now'*. (This was the theme of *An Experiment with Time*.) So this ability to intervene at the 'now' makes each of these creatures a thing which can use intuitive 'purpose' to adapt its nervous system to meet a coming emergency—a creature which can initiate what becomes subsequently a 'conditioned reflex'. It seems probable, then, that early in the history of evolution your forerunners developed the then urgently necessary habit of focusing attention about that travelling 'now' where intervention is possible. The urgency departed with the development of a thinking brain far more capable of dealing with a threatening situation; but the *habit* of watching the danger point may well have persisted, and this is the reason advanced by Serialism for the fact that you do, while awake, confine your attention to the vivid sense data at the 'now'. Whether this reason is or is not sufficient, the fact remains that you do follow the 'now' with your attention when you are awake, with the result that you have almost, but not entirely, lost your power of shifting attention elsewhere in your four-dimensional field of observation so long as sense

data are being presented at that travelling, three-dimensional 'now'. But when (in time-2) that time-1 'now' comes to a place where the brain's world-line is not in the condition essential to the appearance of sense data—e.g. where the brain is asleep—you lose temporarily your travelling mark, and your attention focuses in uncertain fashion here and there upon the long stretch of duller sense data presented within your four-dimensional field of observation. This, according to Serialism, is '*dreaming*'. The long stretch of sense data provides, so to say, the 'bricks' you employ in building up your dream fantasies: but the fantasy thus erected is largely the province of psycho-analytical study. When the travelling 'now' comes to a stretch where the brain is again in the condition essential to the appearance of sense data (i.e. is awake), the specially intense sense data make their appearance again, and attention rushes back to that point. If the place where the brain is again in a waking condition is a long way ahead, you continue dreaming until the 'now' reaches that place. If there is no such place ahead, you continue dreaming. But your friends say then that you are 'dead'. They are wrong. Death is a time-1 state of the brain: there is no death for the mind travelling in time-2, with a time-1 past for its field of observation.

But for the theory of what the continued four-dimensional life is like in these circumstances I must refer you to *Nothing Dies* or *The New Immortality*.

Such is the doctrine of Serialism up to the time of writing in so far as it is concerned merely with you as the observer of your own sense data. *An Experiment with Time*, *The New Immortality* and *Nothing Dies* are devoted largely to this aspect of the theory, the first-named book dealing also with the experiments devised to bring to light the ability of Observer-2 to see ahead of and behind the time-1 'now', whether that

'now' be at a sleeping or waking pattern in the brain's world-line.

You may ask whether, when I refer to your four-dimensional mind as the Observer of sense data, I am using the word 'mind' in the conventional sense of a *thinking* entity. For the full discussion of that question I must refer you to *An Experiment with Time:* Chapter XXIII. But I will quote here the verdict arrived-at in that book. The reference is to your personal four-dimensional mind—to you as a particular Observer-2.

'Whatever capacities for eventually superior intelligence may be latent in the higher-order observer, they are capacities which await development. At the outset brain is the teacher and mind the pupil.'

To this I still adhere. Your Observer-2 has plenty of intuitive knowledge: his ability to perceive what lies ahead in time-1 is an instance of that. Moreover, a study of dreams shows that he is thinking in a rudimentary fashion. He makes absurd plans to deal with the dream situations he has reached in his fantasy-building. But the logic, usually, is little better than that of a very young child who supposes that Prince *plus* witch must equal Frog. He is not in the least surprised by any incongruity he encounters: he accepts it without hesitation. I attribute this almost complete lack of intelligence to the fact that it is the subliminal self which is chiefly active in dreams —the so-called 'Unconscious' of the psycho-analysts. But there are times in dreaming when the more rational part of the mind rouses from its uncritical inspection of the fantasies presented to it by its half-witted partner, and then you find definite though still rather feeble thinking going on. It has all the characteristics of brain thinking, incredulity, criticism, judgement, planning: and this is the thinking it has learned from brain during the earlier travels of the three-dimensional

'now'. That is obvious from the fact that it is still an attempt to think, and to remember *three-dimensionally*, so that the thinker does not realize that he is a four-dimensional being with a four-dimensional memory and a four-dimensional 'associational continuum'.

Do not ask me, please, what four-dimensional thinking is like.

The regressions dealt with by Serialism show that we must admit that there are boundaries to our possible logical knowledge—an admission which those who maintain that logic is omnipotent find extremely distasteful. For example: Mind regresses; therefore no description of Mind that science can give can be a complete description of the Mind that can (with the assistance of brain) make that science. That is an unhappy outlook for materialists. But there is some relief from the gloom of this view if we note that the *importance* of the successive terms in the various series dwindles with great rapidity. For example: the difference between you as 'Observer-1' and you as Observer-2 is, as I said at the outset, momentous. The first 'dies': the second is immortal. There is no difference approaching that degree of importance between you as Observer-2 and you as Observer-3. Both are immortal and so are all observers of higher order which enter into the regress of 'you'. Nevertheless, there is a particular kind of Observer-2 (not, I can assure you, 'you' or 'I') who does die in the course of time-2. It is a very peculiar kind of death. We shall come upon it in the course of this manuscript. He, however, has his appropriate Observer-3, who is immortal in time-3 and all higher-order times. That seems to bring death for anyone or anything to an end. Prevision, or as I prefer to call it, 'precognition', so miraculous in terms of time-1 and so simple in terms of time-2, loses significance very rapidly indeed; and there is a regress involved in that queer concept,

'creation', which . . . but I must not give everything away in my opening pages. Anyhow, the main thing *appears* to be (we cannot say anything more positive yet) that all our regressions yield series which are what mathematicians call 'convergent' in that aspect which is Significant.

CHAPTER II

During the writing of the foregoing chapter I became uneasy about its unexpected length. I realized that it must be boring you greatly, seeing that it contained little that was new to you; yet I could find no way of cutting it shorter. None knows better than myself how difficult it is to remember all that complicated stuff, and I could not risk your having forgotten any of it. I find now to my considerable dismay that it will need to be still further extended. Some solace, however, I can offer: what follows will be, to you, for the most part new.

You see, I am going to ask you to accompany me on a rather odd journey; and, for you to be able to do this, we must, at least, start level.

Very well: I have been writing, so far, about *your* mind. My description thereof has not been entirely complimentary, but what I have said applies also to my mind and to the minds of all people. It is about the relation which your mind bears to the minds of others that I must needs write now.

I shall introduce you, first, to a particular brand of 'Solipsism'. The 'solipsist' I have in mind is someone who has realized that all the experience he has, including his awareness of apparent 'other people', is *his* experience. He perceives, therefore, that, in his relation to any world which he could *logically* infer from that experience, he would be playing the part of a single experiencing mind. So far, we may follow him and

agree. But he proceeds, thereafter, to point out that it is impossible for him to discover, in *that* world, evidence that he is not the *only* experiencing mind.

That takes a bit of thinking over: it looks as if there were a trap somewhere. But, if one agrees with the argument, one has no right to dismiss it, irritably, as 'mere hair-splitting'. Hair-splitting is not 'mere' to either science or philosophy. They are hunting for truth. And you may take it as a fact that solipsism is the logically undefeatable bogey of all thinking men.

Fortunately it is not a *prohibition*: the solipsist is not in a position to assert that there *are* no other experiencing minds: he can maintain only that *evidence* thereof is unobtainable by him. So we may agree with him in that and proceed, thereafter, to get past him by a simple act of faith. I shall believe that your mind is of the same general character as mine. You shall reciprocate. Agreed? Then we need not bother about the other people—they, and especially the scientists, performed that act of faith ages ago.

Having linked up in this way with the world of physics, we may return to our Serialism.

Serialism agrees that you extrapolate your inferred three-dimensional surroundings from your own experience at your 'here'. That 'here' is where you can find, if you look for them, your brain and those parts of your nervous structure which physiologists call the 'kinesthetic system'. When you extrapolate thus, you get a world which *contains many other brains but only one 'here'—the 'here' from which you started.* Extrapolating, thereafter, time-1 from your 'now', extends that 'here' along the world-line of your brain, while leaving your 'now' at the starting point of the extrapolation. (*Vide* any book on Serialism.) When you pass energy from your mind to your brain, or energy flows from your brain to your mind,

this can take place, according to Serialism, only where the world-line of your brain is intersected by your (travelling) three-dimensional 'now'. That 'now' is a field which extends outward in space; but your 'here' does not extend thus—it remains along the world-line of your brain. And it is the only 'here' in any world which you could possibly discover *from your own solitary experience.* If you, therefore, as a mind, want to pass energy into, or absorb energy from, *that* world, you must do so *via* your brain at the 'here', and at the point where this is intersected by your travelling 'now'. Your brain, of course, can distribute energy to, or receive it from, other brains by the ordinary physical channels. So far we have followed our solipsist.

But the rest of his stuff is merely a plea of 'no proof'. We dispense with proof, by our agreed act of faith; and, *while accepting everything which has been said in the previous paragraph,* insist that the world-lines of other people's brains mark out 'heres' for experiencing minds accompanying those brain-lines. To each of those minds, its 'here', where intersected by its 'now', is the only place where it can transfer energy to or receive energy from any world which it can discover from it's own solitary experience.

Consider now the world-line of the brain in some other person whom you perceive, at your three-dimensional 'now', as moving. Accompanying that world-line there is, as you have agreed, his mind observing sense data wherever his brain is in the appropriate condition. At his three-dimensional 'now', those sense data present to him the peculiar intensity which accompanies the transference of energy from his brain to his mind; and there, also, he can intervene in the behaviour of his brain by passing energy from mind to brain. Such intervention on his part alters the trend of his brain's world-line ahead of that 'now'. Moreover, intervention on

anyone's part may serve to alter the trend of that brain-line of his.

Now, you will remember that, in Serialism's Regress of 'Free' Will, the four-dimensional observing mind (styled Observer-2) enters the series one stage deeper than the stage in which his brain-line appears. The brain-line falls into compartment A_2, the place for mechanically determined material sequences. But 'Observer-2' comes into the row of compartments below that. He is, more specifically, in compartment C_1. This means that he is not subject to that mechanical sequence which determines the trends of brain-lines from the time-1 'now-point' onwards. There is nothing, therefore, to compel any particular mind to follow the sense data related to any particular brain-line when that brain-line alters its trend. How is it, then, that we find your mind following one sequence of sense data, and my mind adhering strictly to another, when the sense data themselves may be so unpleasant that any mind would be glad to lose sight of them?

There can be only one answer to that question. It is a very simple one, and it was given—although much too tersely for easy comprehension—in Chapter XXVI of *An Experiment with Time*. There is no narrow world-line of mind adhering to any man's brain-line. Expressing that three-dimensionally: there is no mind following his body about. Instead, *the mind which observes sense data fills the whole of that four-dimensional continuum which is composed of space extended in time-1*. Consequently, however a particular person's brain-line may alter its position ahead of the time-1 'now', *there will always be mind contiguous to it*—mind observing sense data where his brain is in the requisite condition. And it is the presence of his brain-line, with its strong personal characteristics, which confers personality on the intersected portion of this space-filling mind.

This person, in turn, must come to a similar conclusion concerning you and your mind.

Both of you, therefore, are agreed about a space-filling mind. He and you have ceded, by a joint act of faith, any claim to consider it solely his or your mind. You both surrendered that when you each asserted that this mind provided the mind of the other of you two—wherever that other might be in space. Yet you continue to maintain that, so far as your *personal* experience is concerned, there is only one 'here' in all that space, and the other person has not receded from his own attitude in that respect. You will remember that we agreed that all must maintain that perfectly logical position about *personal* experience, when granting, by the act of faith, minds to one another.

What, then, is this space-filling mind which is neither the other person's mind nor your mind, but which, in the space of his experience has only his 'here', and, in the space of your experience has a 'here' which is yours alone? The answer is that we have committed ourselves to regarding it as a Universal Mind, and to the view that the space-filling mind of the other person's experience and the space-filling mind of your experience are only *aspects*—individual aspects—of that one great Universal Mind. The nature of such an 'aspect' I shall explain a little later.

We have not attributed *personality*—much less sex—to this Universal Mind. Personality comes into the picture only where the Universal Mind is intersected by the world-line of some human body. There we have an individual mind which is the product of Universal Mind and human body—something which, if we like to lapse into metaphor, we can describe as a 'child of God and Man'. And remember, in that *aspect* which the space-filling Universal Mind presents to any of these individual persons, that person, basing all space upon

his own, solitary 'here', must *seem* to be the only such 'child of God' in the universe. But you surrendered intellectually such 'only-sonship' when you refused firmly to be in any way the only apple on the tree. It was not till thereafter, and as a consequence of that surrender, that you discovered the Spirit of 'God'.

We are left now with a Universal Mind which is the only thing that observes sense data, so that we must regard it as extending in space to wherever we consider that sense data might be observed. Moreover, we cannot deny that sense data 'were' (in time-1) observed long 'before' you were born and 'will-be' (in time-1) observed long 'after' you are dead. According to Serialism, sense data—which are four-dimensional presentations—are present (in time-2) everywhere along the time-1 stretch where brain can be found in the requisite state. The Universal Mind must extend therefore in time-1 from the dawn to the sunset of sensory life. (This range in space and time-1 is described in earlier books on Serialism as a 'field of presentation'—of sense data—called 'field-2', and the universal mind is described as a Super-Observer capable of observing sense data anywhere within that range and actually observing simultaneously (in time-2) all sense data that are there.)

Now, 'attention' (*vide An Experiment with Time*) is not to be confused with 'observation'. It is the *concentration* of observation upon something which, previously, was being observed in vaguer and less interested fashion. It must not, moreover, be confused with the focus of vision. The latter *moves* as your eyes move. But the focus of *attention* relaxes in one part of the field of observed sense data and a new focus concentrates elsewhere. One focus may be relaxing while another is concentrating, and one cannot regard that as the 'travelling' of a focus from one part of the field to another. You can test this best

with your eyes shut. Press your finger on the table: press the tip of your tongue against your teeth: transfer your attention from the one phenomenon to the other. It is true that I write habitually of the attention of Observer-2 as 'following' the time-1 'now'; but this 'following' is only a concentration of attention around the part of the observing element which the 'now' has just reached accompanied by a relaxation of attention around the part which that 'now' has just left behind—a travelling, in short, analogous to that of a wave. This apparent travelling with the 'now' takes place at the speed of light; but, when the 'now' is traversing a stretch where the brain is dormant, and attention is focused on sense data ahead of that blank stretch, as in previsional dreaming, there is not even that kind of wave-like travelling to the place in question. Observation at that part may be concentrating while observation at the place where the brain is falling asleep is relaxing. In dreaming, moreover, observation may be concentrating (attention may be focussing) at half-a-dozen places in your time-1 history simultaneously, and producing thereby those strange synthetic images which are so characteristic of dreams. This explanation of these curious blendings was given in Chapter XI of *The New Immortality* (the piano illustration), repeated as Chapter VII of *Nothing Dies.*

The Universal Mind's range of attention is limited only by the limits of its field of observation; and that, as we have seen, is pretty extensive. But how far does your share in that field extend?

Consider the whole four-dimensional space and time-1 world which is occupied by the Universal Mind. Remember that time-1 is merely 'one-way' space—a pseudo-time—and that real time is time-2. Then consider that four-dimensional world as it would appear if extrapolated in all four directions

from the comparatively tiny place which is your brain's world-line. That world, thus extrapolated, will contain the Universal Mind regarded as related solely to you: for it will have only one 'here'—the base from which it started—your brain-line.

Consider the four-dimensional expanse as it would appear if extrapolated from the tiny place which is my brain-line. It will contain the Universal Mind as this is related to me—a mind with my brain-line as its only 'here'.

Consider the four-dimensional expanse as it would appear if extrapolated from the tiny place which is the brain-line of Julius Caesar. It will contain the Universal Mind as this is related to Julius Caesar—a mind with Caesar's brain-line as its only 'here'.

Obviously, none of these three minds filling space and time-1 but possessing single though different 'heres' is entitled to be called the Universal Mind pure and simple. For the Universal Mind is the Common-to-all Mind and does not depend upon any specially favoured 'here'. Each of the three minds is a particular *aspect* of that Universal Mind.

Here, then, are three aspects of the world-filling Universal Mind, coextensive with that mind. The aspect which has your brain-line for its 'here' depends upon your brain-line for its existence. Clearly, it is your share in the Common-to-all Mind. It is *your* mind. Similarly, the two which have, respectively, my brain-line and Caesar's brain-line for their 'heres' depend upon those brain-lines for their existence. They are, respectively, my share and Caesar's share in the Universal Mind. They are, respectively, my mind and the mind of Julius Caesar.

Thus, you *are* the Universal Mind, as this appears when regarded as extrapolated in the four-dimensional world from the comparatively minute spot occupied by your brain-line.

So that your field of observation is merely the Universal Mind's field extrapolated in the same fashion. Consequently, your attention (*once you have learned to control it*) can range in *your* field everywhere that the Universal Mind's attention can range within *its* field.

But any sense data remote from your own that you may come upon in such explorations will have the peculiar dream-like quality of your own sense data ahead of or behind your time-1 'now' as these are observed when dreaming. This is because, as said already, you will discover no 'here' in *your* field other than that which is provided by your brain-line. You cannot in this attention-wandering, receive energy from any brain-line not at your unique 'here', whether or not your focusing chances to 'hit off' that distant brain-line's time-1 'now'. Consequently, such remote sense data as you may discover will lack the sensory intensity which accompanies such passage of energy. If, however, the remote sense data in question happen to be those 'generic images' which are associated with 'thinking', you will be reading another person's mind; and that, of course, is telepathy. Incidentally, we may note, the odds are greatly against your hitting off his 'now'; you are more likely to focus behind or ahead of that position.

Here is another point to be noted. You cannot, in your attentive explorations, pass energy direct from your mind to another person's mind—your unique 'here' prevents that. This involves that no person whose time-1 life has ended, but who is surviving in time-2, can forcibly 'control' the mind of an alleged spiritualistic 'medium' or the mind of anyone else. But, if you, for example, read telepathically another person's mind, you may be influenced thereby—just as you might be influenced by reading a book. So much, but no more, we may allow to a 'medium'. We shall, however, be dealing with that subject more extensively in a later Chapter.

Let us return now to the space-filling Universal Mind. Your mind is an aspect thereof, and so is mine. It is streaked with many people's world-lines and has as many differing aspects. But it does not depend upon those streaks for its existence—on the contrary they depend upon it for their minds. It is, therefore, something over and above a synthesis of the differing aspects associated with those streaks: it has independent Being.

Does it observe the intense sense data at your 'now'—does it, e.g. experience your pain? Of course, it does! Your mind does that, and your mind is merely one aspect of the Universal Mind. Can it intervene—alter the behaviour of your brain by passing energy thereto at your 'now'? The answer, clearly, is similar: what you can do and what you do, it can do and is doing. Yes, but we have agreed that it is something over and above those aspects of it which are individual minds —that it is a Mind existing independently of those aspects. Can it alter the aspects it provides—can it, in other words, alter those merely personal minds?

Well, consider what capacities Serialism allows to the *individual* minds, apart from their abilities to interfere with the activities of their brains. These are: (a) control of attention; (b) an ability to learn from experience; (c) foreknowledge of sense data lying ahead in time-1; (d) as a consequence of (c) and (b), *purpose*, exemplified in intervention effected to avoid, or ensure reaching, those foreseen sense data; and (e) a very limited amount of thinking (tutored by that mechanical thinker, the brain). Since these characteristics appear in the individual aspects of the Universal Mind, we can hardly deny them to that mind in its totality. But consider, also, the aeons it has had in which to exercise these faculties, and couple this with the fact that it can attend to the time-1 futures of *all* the world-lines (with their associated sense data) simultaneously.

One can hardly imagine it as 'thinking', i.e. laboriously weighing pros and cons before taking action. It is watching the brain-lines of individuals for centuries ahead, watching them changing their trends as their individual minds intervene, watching lines in the remote time-1 future disappear (becoming 'might-have-beens') and new lines coming into unassured existence—why! it must needs exercise a lightning judgement which is far in advance of any man's ordinary thinking; for it is going to experience that time-1 future in intensity when the time-1 'nows' reach it. It must be active beyond measure, and all such activity must involve changes in the aspects it presents to the individual 'heres'—alteration, that is, of the individual minds.

But let me ask you this: suppose it does exercise such control, how can you possibly tell whether the resulting activity of your individual mind is due to the *intrusion* of the Universal Mind upon your personal mind's province or whether it is owing to some subliminal process peculiar to that personal mind in its own sovereign and uncontrolled condition?

('Intrusion?'—No, not good enough. 'Intrusions?'—plural, and including the note of interrogation? Yes! *That* shall be the title of what, I foresee, is going to be a new book.)

CHAPTER III

You ask, in effect, why, if there is a God, he does not give each of us some simple, clear proof of his existence. That would save all the doubt and bother, and make everybody happy.

This is one of those devastatingly logical questions which children ask and which none answer. How can people who are trying to inculcate belief in Old Testament stories answer it.

The reply that can be given to a grown-up is as follows:

(1) The Universal Mind does not, so far as anyone can tell, perform physical miracles. It does not raise storms to wreck Spanish Armadas or to hamper English landings on the Continent. It does not bring people back from the dead. There is no reliable evidence that it has ever done so. And, according to Serialism, its intrusions (which give it quite sufficient control for its purposes) consist simply in influencing people's individual minds. What sort of clear proof of its existence *could* it give?

(2) You suggest that it might reply to test questions, 'oracle' fashion, by controlling people's minds to give the correct answer through some one or other of the Spiritualist paraphernalia.* But surely, if life is here for any purpose whatsoever, it must be to develop individual minds, individual purpose, individual initiative. Consider, then, what would

* (Your book-tests come under that heading.)

happen as soon as people discovered that 'God' would give correct answers to questions for anyone who took the trouble to propound them. All individual initiative would decline: men would cease to develop: instead, they would take their difficulties to this most handy Oracle, leave all decisions to 'God', and degenerate into mere 'yes-men' who have sold their birthrights for a potage of security. For God would have to keep on answering: no single answer would suffice: only a great multitude of correct replies would carry real conviction as being beyond the bounds of coincidence.

(3) Why, if His purpose is to develop individual minds, should He *want* people to believe in Him? Granted that, in the early days of the human race, men were not yet capable of choosing the good (whatever that may be) of their own accords, so that some inspirational direction from an accredited 'God' was essential, why should the need of that belief be permanent? Surely the aim would be that they should become capable of choosing aright by their own common agreement, and not remain mere 'yes-men' doing what was, incomprehensibly, 'God's Will'.

One would expect, then, to find to-day a growing appreciation—a reasoned appreciation—of what is the common 'good' to be aimed at. One may realize that occasional intrusions might still be needed to save men from, e.g. a culminating fury of mutual destruction due, psychologically, to the gloomy teachings of ignorant materialism; but, as we have seen, such intrusions can be effected without arousing undesirable continuance of the belief in a potentate who must be blindly obeyed. Why, then I repeat, should God *want* people to believe in Him?

I have been writing, so far, about a Universal Mind (not to be confused with the Deist's notion of a 'mind of the universe'); and I have been attributing to it *purpose* on a vast,

long-term scale, governed by, at least, the fact that it actually experiences all our pains at our time-1 'nows' and knows what further pains will develop for us and it as those time-1 'nows' advance into the alterable 'time-1' future. But those who are startled by the notion that 'God' might not 'want' people to believe in 'Him' are attributing to that Mind personality of a more human description. Very well, face the question on that basis. There are those who say that He will guide us, if asked, but that He must be asked first. But it must be absolutely unnecessary for Him to be *asked* to intervene in that way. We can hardly imagine a God who would sit sulkily, watching His plans go to ruin, merely because none believed in Him. We may like to attribute to the Universal Mind some of the characteristics of personality; but there is no necessity for us to saddle it with the personality of a fool. Is it any more complimentary to regard him as a kind of Victorian 'Papa' demanding daily thanks, or as (crowning insult) the sort of thing which seeks 'praise'? I can find no clear reason why even a God with a human-like personality should have a craving for public recognition, seeing that we should all regard such craving in any of our friends as a symptom of human imperfection. So, if policy suggested that it would be best for us to seek now our own salvation, the Universal Mind would prefer, obviously, to do any necessary wire-pulling in secret.

None of the foregoing, however, suggests that attempts at nearer personal *acquaintance* would be rebuffed. For that kind of approach could involve no more than an adventure so strictly private to the individual that it could never be made to serve as a public proof.

I have pointed out that you reach God intellectually by a very simple process. You refuse to think of yourself as 'the only apple on the tree'. The rest, in Serialism, follows. And

the *converse* is true. Refuse the act of faith in the existence of a Universal Mind, and you are (in Serialism) refusing that act of faith in the existence of other people like yourself which is the escape from solipsism. Similarly, of course, if you claim that your knowledge of 'other people' is 'intuitive', you are making the same claim to a knowledge of the Universal Mind. The two knowledges are (in Serialism) intellectually identical. Now, something of the same sort holds good, I suspect, in the sphere of what metaphysicians call 'feelings'. You refuse to feel yourself the only person that *matters*; you feel that other people matter equally; and—you find God. Moreover, there are many who are sick of their unpleasing selves. They long desparately to escape from self—to find something more satisfying. The way of escape was pointed out by a man who had found it; and it amounted to no more than granting to all men equal importance with yourself. He suggested a standard petition, and it is one which does not contain the words 'I' or 'me'. Now, merely to despair of your 'self' is weakness. If you do not like that 'self', you should, at least, try to alter it. But that is a wearisome and, for many of us, a losing battle: the biological factor of inherited personality is too strong. Nevertheless, to 'recoil' from your 'self' in the world of mind is the same thing as to be attracted towards something external to that 'self'. 'Recoil' and 'attract' are, of course, words borrowed from the language of physics: but they do seem to fit very nicely in the world of mind, if we claim that 'dislike' and 'arouse liking' are analogies. For to recoil from your 'self' is—as we saw in Chapter II—a recoiling from a particular *aspect* of the Universal Mind—the aspect which is you. And the only mental thing left for you to recoil to is the Universal Mind in its completeness. (This, as we saw earlier, is a great deal more than a synthesis of aspects presented to various personalities.) That mind has under-

standing and courage (remember that it experiences all our pains and troubles) and it is possessed of wisdom unequalled. It is, certainly, attractive.

Speaking from experience, I do not think that it rebuffs those minds which turn to it in the craving for something better than themselves. Such an approach is not a request for an intrusion. The 'intrusion'—the apparently welcomed intrusion—is from the seeker.

I am beginning to feel now like an incompetent skater who has started out upon the frozen surface of an endless lake with a strong wind behind him. I cannot see how I am going to stop. One of the main things you wanted to know was how to tell a genuine inspiration from a self-contrived fake. All that I have done is to show you that each of us is, so far as every day experience goes, in a sort of solipsist trap, and that, although there are ways of escape from this, it is extremely difficult to tell whether one has, in fact, escaped, or whether one is using one's vast, unrealized powers to produce the sort of fake-inspiration which pleases. Obviously, it would be cruel to leave you derelict on a raft in such a sea of doubt, when I know perfectly well that there *are* ways of reaching, if not the shores of absolute certainty, at least land which borders on these. But that means that I shall have to tell you a very long story—a story which, I see now, I have been trying to avoid telling.

Very well, I suppose there is no getting away from it. Permit me to abandon my skating metaphor and—make room for me, please, on the raft.

In the history of religion there are many accounts of supposed 'inspirations', but in no such instance that I can recall does the person concerned appear to have entertained the

smallest doubt as to the origin of the 'message' received. Certainly, none have subjected the alleged inspiration to analytical criticism. Others, later, have done this for him; but that is never a very satisfying proceeding. It would be far better if someone with the requisite knowledge of psychology were to be the subject of a group of such adventures and were to criticize them at first hand.

Now, it so happens that I have experienced in my own person a thoroughly representative set of such apparent intrusions. It happens also that experience had rendered me extremely suspicious of all 'inspirations', so that I subjected these particular occurrences to a most painstaking analysis largely hostile in intent. These two things—the representative character of the experiences and the criticism to which they were subjected—renders the whole story of the occurrences unusual, and, as such, it constitutes a contribution to our general knowledge. It has, in that respect, certain specific values, namely

A. It will serve to warn the over-credulous of the traps which lie concealed in such happenings.

B. The occurrences showed certain very marked characteristics, so that, if we decide, on the score of probability, that they were genuine intrusions, their description will serve as some kind of criterion to which we may submit other experiences posturing as inspirations.

C. Those of these occurrences which were disguised as verbal messages had an extremely valuable *suggestive* side. They constituted, so to say, 'tips' regarding new paths which it might be profitable to explore. Moreover, if the content of the 'messages' could be shown logically to be true, it would constitute a quite startling contribution to our theological knowledge.

I have been greatly worried about what I ought to do in the matter of publishing that story. To do so might distract attention from those mathematical arguments for the existence of the Universal Mind. It might lead people to suppose that I had asked them to base their belief merely on the strength of a few narrated experiences for the occurrence of which they would have to take my word. I had intended, therefore, to write out the story and leave directions for it to be published some ten years after my death; by which time, one may assume, the truth of Serialism will have become generally realized. I have been putting off the beginning of that task because others seemed more urgent; but I know now that I should *never* have found a time when there was not something more important to be done. Your letters have forced my hand; for they deal with 'interventions' and 'messages', and, to answer them properly, I must needs cite my own experiences as illustrations of what is and is not probable in such matters. So you may take it as certain that, if your troubles had not occurred and had not proved so distracting that you were driven to write to me about them, my story would have died with me.

In narrating these experiences of mine, I shall try to describe very clearly what were my immediate reactions to these. To enable you to understand those reactions I shall have to tell you something of my early childhood. At the age of six I had a serious accident which confined me to my bed (movable on to a flat, wheeled carriage) for three years, and limited me to crutches for two more. The result of my total inability to do what other children did engendered in me, naturally enough, a deep sense of inferiority, which none tried to remove. But it did something more important. Toys were almost useless to me, and one could not read all day long. I used to lie for hours indulging in—odd though it may seem—

metaphysical speculation. By the age of nine I had worked out for myself, in order to get rid of the apparently endless 'inwardness' of matter, the theory of atoms. I had, also, perceived clearly the obvious 'serialism' in our common conception of time—although it seemed to me devoid of any real significance. I had what I know now must have been an unusual streak of stubbornness. When I wanted to know (as every child wants to know) why God didn't kill the Devil, it was useless for anyone to try to put me off with such remarks as, 'Hush! He knows best. We must not question His Wisdom.' I knew that this meant merely that the speaker was just as much puzzled as myself. I used to drive my little Hospital-trained Nurse almost to desperation; and I remember well how, when I had stumped her with some theological poser, she used to take refuge in an exasperated, 'Now, *do* you think that you know better than the Archbishop of Canterbury?' That never failed to take me aback, for I had a terror of conceit. With my deep sense of inferiority, I thought of conceit in my case as something too absurd for words. Moreover, someone—almost certainly my Mother—must have shown me how greatly it could cloud one's powers of judgement; for I cannot remember a time when I did not regard it as a dangerous mental poison. Nevertheless, when Nurse had left me defeated, I used to wonder, stubbornly: Wasn't it possible that that Archbishop might, *sometimes*, be wrong.

It is certain that I developed into an 'odd' child. I could read Euclid as easily as a grown-up person reads a novel; but my father despised mathematics, and my schools regarded them mainly as something which took up time better devoted to Latin. So that chance was missed. I was not allowed to play games, so the sense of inferiority persisted. But I had compensations in a great power of imagination. Moreover, I

had a secret solace. Between the ages of twelve and thirteen I experienced on three or four occasions the curious thing which is called, I understand, 'ecstasy'.

I can remember only the last of those adventures, but I can recollect vividly my delight at finding that what I called 'it' was coming on again. The cause, that time, was a garden viewed from my bedroom window on a still and silent night. As I stared at it, there came upon me an overwhelming awareness that everywhere, just behind that scene, lay a reality too wonderful, joyous and exciting for words—a reality which was making itself more and more apparent—a reality on the very point of breaking through—a reality which I should *remember* then as, 'of course', having always been there. Then, as I waited eagerly, I began to sense through the growing transparency a multitude smiling at me and pleased with my delight. The feeling grew until the joy was almost unbearable; and then it faded away, and the scene strengthened into impenetrable solidity. But I was left happy.

CHAPTER IV

At the age of seventeen I was a pupil on a South African farm, and I was, for several reasons, in an extremely disgruntled condition. To begin with, I had just lost all belief in the existence of God. This was from the usual cause. A foolish cleric had given me a false reason for that belief. It had seemed to me sound; and, in accepting it eagerly, I had realized that my previous grounds had been utterly insufficient. Later on, I discovered the fallacy in the man's argument—and found myself with nothing left.

In the second place: I was extremely keen on singing, and had just discovered that a callous choir-master had ruined my voice (I had been the school soloist) by making me continue to sing *alto* long after that voice had begun to crack. I had waited for two years before trying my new, man's register; but, when I did so, I heard to my dismay a horrible reedy thing with a range of barely twelve notes. How I cursed that master, and how I longed to curse the God in whom I no longer believed.

Finally: I had supposed that I could write. I had sent a short story to a Capetown periodical. After two months had elapsed without an answer, I had written again. Now, a fortnight had gone by without any reply. So that enterprise had failed. I was only seventeen, and these three major disappointments, one on the top of the other, had shaken me to my rather shallow depths.

At that moment I made a curious discovery. Normally, I was a fairly decent young fellow. But I had strange bouts of savagery in which I was no better than what we should call to-day, a young Nazi. I did things at which I was aghast in my more normal moments. Thinking this over, I came to the conclusion that I was in some strange way *two diametrically different persons occupying the same body.*

I do not mean that I was a case of 'split personality' in which one individual is unaware of the existence of the other. Yet I was aware that I might choose which of these two persons I should be, and then get rid of the other. My angry disappointment about God bid fair to turn the scale. Goodness was nonsense: there was neither good nor evil: my so-called 'evil' personality was by far the freer of the two, and there were no limits to what it might achieve. Reason said: give it rein.

That question almost settled, I saddled my horse and rode into Stellenbosch to change my book at the English library. I could find nothing with a good adventurous title save those which I had, already, read. There was a book called, 'Dr. Jekyll and Mr. Hyde' which sounded dull enough. But it was by Stevenson, who had written 'Treasure Island', 'Kidnapped' and a very boring book called, 'The Master of . . . something or other'. This Jekyll-Hyde novel could hardly be worse. So I slipped it into my pocket, unopened, and rode home.

Picture me at ten o'clock that night, reading by the light of a single candle, my hair standing on end. God! what I had escaped! *My* evil self, I saw clearly, would never have remained the Superman I had pictured it. Like Hyde, it would have sunk lower and lower as it threw off the trammels of its Jekyll.

But (I thought) what a marvellous coincidence! At the very

moment when I have decided to give my Hyde the mastery, I pick up the grimmest story ever written—the story of a man who did that very thing. Coincidence be damned! The chances seemed millions to one against it! There *was* a God! and He had intervened in the promptest and most effective way possible.

Then I did an extraordinarily silly thing. I offered God a bargain. (I was very young, of course; but I had no business to make such a bumptious bloomer.) I promised that, if the despaired-of letter would arrive by the next post, I would believe 'the whole thing', by which words I meant 'Pauline Christianity'. And next morning that letter arrived! My story was accepted! And . . . I found, a little later, that I *could not* believe what I had promised to believe.

Now, if there had been intervention in all this, note how I had upset the plans of whoever was the intervener. That letter of acceptance must have been in the post when I offered my bargain. The intention had been, presumably, that I should work up to my moral crisis, come to the foregone decision to let my Hyde win, ride in and take the book, receive my shocked awakening, perceive the intervention of, apparently, God, ask for forgiveness, experience the second coincidence, (the arrival of the letter following my penitence) and find, in the conjunction of the two, enough to convince me that God had been looking after me through all the time of my troubles. And I had spoiled half the plan by butting in with my silly promise.

Now, I want you to understand *why* I had offered that absurd bargain. I wanted very much to believe the Christian story. Had my desire been in the other direction nothing would have made me let the decision rest on a chance which so easily might have gone against me. But I was tired to death of the whole business of religious doubt and specula-

tion. And it seemed to me that, if God was so ready to intervene, He might be quite ready to intervene a little further—in which case I should be saved the bother of having to make up my mind. And if the letter did not arrive, no harm would have been done. I was not, in that event, bound to *dis*belief. I saw an opportunity of saving myself trouble—of throwing the onus of a difficult decision on God—and that with the proviso, 'Heads! I win. Tails! We'll try another way.'

There was no 'intervention' to prevent the posted letter from arriving. So I remained stuck in the curious pit I had digged for myself. I *wanted* to credit Christianity. Reason refused permission. But I *must* do so, because I had promised that to the God in whom I *did* believe! For ten uneasy years I had to shilly-shally in this fashion; and, during that period there developed within me what grew to be a veritable horror of the notion of urging upon anyone *any* belief which could not be securely based upon cold, unsupplemented reason. There was a great deal more than ordinary scientific reluctance in this. There was an absolute loathing of the idea: a temperamental terror that I might through carelessness do some such thing. Later on, that proved to be an attitude of mind almost essential for the work I had in hand. So, if it had been intended that I should tackle that task, those ten years were not so much punitive as educational. Hence I might have been even prompted to make my foolish promise.

Perhaps it might be as well for us to remind ourselves here that we are not seeking in these occurrences evidence of the existence of a Universal Mind. That existence we have presumed—on purely logical grounds. What I am trying to tabulate, criticize and study in the hope of finding some common characteristic are incidents which *look like* 'intrusions' by that Mind upon my mind or the mind of some intermediary agent. Does the occurrence I have just described fall into that

category? Was it an *apparent* intrusion? I think it was. All that we know from psycho-analysis shows that the subliminal stratum, although possessed of precognitive abilities, is very feebly equipped with rational faculties. Its greatest mental feat appears to be the substitution of associated mental images for others which, owing to its acquired inhibitions, it is shy of facing. It cannot even build up a logical story in a dream, and would seem to be quite incapable of the elaborate planning necessary to produce the occurrence I have described. Moreover it is, morally, no Jekyll but a suppressed Hyde, seeking Hyde's satisfaction. As for the conscious part of one's multidimensional being—the part which thinks and wonders in dreams—that, according to Serialism, is, though rational, still far too childlike to be capable of laying deep plots for the benefit of a lesser, waking self. It has, in most cases, even forgotten that such a self is going to wake.

Granted, then, that the episode just related bore an appearance of intrusion sufficiently marked to render analysis advisable; we may note its possession of two characteristics:

(1) It was not expected.

(2) It was purely educational.

What happened to Hyde? That fellow was 'subliminated' quite easily. I discovered that beneath his savagery lay a nasty streak of cowardice—probably the cause of his existence. So I turned him into a bantam-weight boxer fighting dogged and gory battles with any middle-weight he could find. That cured him, and he grew up to be a soldier and a pioneer of aviation.

CHAPTER V

A year or two after the Jekyll-Hyde episode, I, moved by a book of Florence Marryat's, decided to 'investigate' Spiritualism. This is a cult in which most beginners profess to be actuated by the coldest scientific interest. I have never met one who would admit that he was merely marvel-hunting. But, whatever my motive was, scientific interest caught me the moment I realized, in the middle of a long spell of very plausible 'automatic writing', that I knew exactly what the end of an unfinished sentence was going to be. I threw down the pencil. 'You damned fool!' I said to myself, 'If you *know* what the sentence is going to be why do you bother to *write* it? Why not *speak* it, or, more simply still, just *think* it?' I sat back to consider how I could possibly have contrived to engineer myself into so abject a state of self-deception. In a few minutes I had discovered the simple explanation.

One begins this sort of thing with a little board called a 'planchette' running very lightly on castor wheels and equipped with a pencil which marks the paper on which the instrument is moving. The finger-tips are rested very lightly on this board, and the slightest tremor of one's hand is enough to start the thing moving. Now, one has been warned that, although one must not guide the machine, one must *on no account* check its movements. That is an instruction which it is *impossible* to carry out. Nobody can follow an erratically moving object with his hand at *exactly* the same speed as that with

which that object is moving. Consequently, as one's chief endeavour is to avoid holding the thing back, one is bound to *push* it—although the push is below the threshold of consciousness. The push makes it run faster; the endeavour to catch up and avoid drag involves harder (though still unconscious) pushing: and in an instant the thing is racing swiftly over the paper. Unsteadiness in one's hand makes the motion change direction. One expects that the formation of a letter is beginning and watches the curved path carefully to see what the letter will be. It looks (let us say) like the beginning of a Y. One is careful not to check it from travelling in the direction needed to complete that Y. *Therefore, one is bound to push it in that direction.* One realizes that Y is the beginning of 'Yes'. (Careful now! Don't check it!) 'Yes' follows. 'Who is writing?' one asks. Off it goes again. That looks like the beginning of an 'M'. It *is* an 'M'. 'M' is the beginning of 'Muriel'. It has written 'Muriel'. The secret is that the faster the instrument moves the less easy it is to perceive that one is hurrying it along in the direction one expects it to take. The change to a lightly-held pencil is easy. And one begins to write reams of what one *expects* the pencil to write.

The instruction given: to avoid restraint, is not strictly necessary. For at the bottom of all phenomena in which the motion of something under the beginner's control is the means of reply to a question lies a very well known psychophysical Law. '*Unconscious muscular adaptation always accompanies expectation.*' In other words: if you expect to move in a certain direction, your muscles get ready to make that movement, and in so doing, *block all other routes of travel.* The slightest tremor then starts movement in the required direction. But it requires the Spiritualist's instruction to *follow* the moving object, before speed can be worked up sufficiently to produce really good results.

It is amazing how powerful the force employed in this unconscious guidance can become without the guide being aware that he is exerting himself at all. It is easy to discover this if you try the 'willing' game. You leave the room. Those who remain decide on some action which you are to perform on your return. You re-enter, and someone selected for the job encircles your wrist lightly with his fingers. Do not stand still. Move rapidly in trial directions, half a step each way, so as to pull his fingers this way and that. You will find that in one direction there is no check. Take that direction rapidly, shouting to him to *think hard* of what it is that he wants you to do. The resistance to movement in any wrong direction becomes adamantine, and a moment later the man is actually dragging you in the direction which he expects you to take. When you reach the proper spot, he refuses to allow you to go further. His fingers restrain you like a manacle. But if you tell him afterwards that he exerted the slightest force, he will be so indignant that insistence on your part may lead to a serious quarrel.

Capper, the great expert at this game, made me aware when I was holding his hand, that if, while on the run, I 'thought hard' of a particular place in the room, I was bound to run thither. There was no need for my hand to hold his wrist, he had merely to rest his palm on mine. Such is the unnoticed power of *Expectation.*

Almost all spiritualistic phenomena at séances where there is no trance-medium present, are based upon that power.

A public séance of this kind, where there are some thirty or forty people present, can become like a scene in a lunatic asylum. Half of those present, the half who are obeying strictly the Director's order to resist no impulse, however absurd, are rocking and shuddering like negroes at a revivalist meeting.

Some will be even rolling on the floor. A few will be making unintelligible noises, believing themselves to be on the way to 'voice mediumship'. But nothing occurs which is not the most obvious self-deception. One is reminded strongly of St. Paul's rebuke in one of his Epistles. Of what use was it, he demanded, to speak with voices if none could understand what was said?

But the most horrible thing to be seen in all the ramifications of spiritualism is the state of the old men who have become permanent victims of the self-deception involved in obtaining answers from automatic writing, 'Ouija board' or table tilting. They have lost all initiative; they fear to make any decision without first consulting their spirit 'guides'; they are poor, because their timidity and spinelessness have put an end to any chance of promotions in their various employments; they have lost all critical faculty through long indulgence in credulity; and they sell or buy on response to 'messages' dictated to themselves by themselves with what little remains of their brains.

Practically all intelligent spiritualists are fully aware that those early stages of apparent 'mediumship' which are observable in a considerable percentage of beginners are merely examples of self-deception. They put up with them, however, on the score that these things may be the necessary preludes to performances more sincere. That I doubted. To my mind the self-deception would become merely more and more profound, more and more unnoticed by the victim, until it would become almost impossible for any real intruding intelligence to get a genuine message through that egotistical crust. I had good grounds for that belief. After I had discovered the machinery of the self-deception in my own case, I had experimented with myself freely. I had found that the degree of the self-deception—the amount that one could

swallow without immediate detection of the fraud—increased at an alarming rate. From the initial 'goose-flesh' shudderings (started, I found, by any sudden expectation that one was about to be influenced by some mysterious agency) to the adaptation of the vocal chords to the *expected* impulse to speak, was a remarkably easy step; and I could realize clearly that any ensuing speech would be as much one's own composition as is the script in automatic writing. But I had barred speech. So far, I had maintained control of my critical faculties—I could study what my mind was doing—but there was a risk that speaking might introduce complications which would weaken that control, and that was a risk which I refused to run. To give imagination that much rein might lead to self-hypnotism—sham, self-induced trance, in which one's continued self-deception would be *completely* beyond one's power of recognition, and become a source of intellectual danger to all credulous listeners. I could imagine no fate more horrible for any man.

These musings came to a head at the end of one of the public séances of the Cape Town Spiritualistic Society, and I vowed then and there that I would play no more at this highly dangerous game. If there were mediums (I thought) they were born so, and were not the outcome of practice in all this quaking, shuddering, grunting, table-pushing business. Moreover, I had an unusually good brain (this I had discovered, to my immense but pleased surprise, at the weekly sessions of the Cape Town Chess Club), and that was a new toy to be guarded carefully. This spiritualism was (it seemed to me) dangerous to the intelligence. A headlong growth in credulity—which means a rapid weakening of the critical faculties—was the most obvious characteristic in people who attended séances, and never more apparent than in the histories of spiritualistic experiences written by great men.

No! if communications from some other world were possible, they would have to come to me unsought—*I* was not going to look for them.

CHAPTER VI

Now, I have been saying harsh things about Spiritualism, while owing a debt of gratitude to a tiny knot of adherents of that cult. The nature of that debt, I must, in common honesty, report.

Having come to the somewhat truculent conclusion just described, I looked up to see a stranger approaching me across the crowded hall. He smiled as he arrived, and asked *sotto voce*, 'What do you think of all this?' Presumably, he had been watching my face and had been amused at my obviously disgruntled condition. I answered, 'Not much. It seems to me to be all pure self-deception.' He said that in his experience it was impossible to get anything except through a real medium, and went on to explain why he had spoken to me. It appeared that he and some friends had discovered such a medium—a trance-medium—living in the suburb called (but my memory may be at fault here) Mowbray. They held seances there weekly in a room at the Town Hall. The medium was not a professional, and they paid her nothing; but they were getting the most wonderful results. They kept it all very quiet, because if *this* crowd (he waved his hand contemptuously) discovered that they had a real medium, they would simply rush the place. But would I like to come to the next meeting and see for myself? Forgetting my recent resolution, I replied gratefully in the affirmative; and an appointment was arranged.

The room used for the séance turned out to be a small upstairs Board-room, rather bare, with a plain deal table running down the middle. Two long wooden benches, one on each side of the table, provided the only seating accommodation except for a chair at the head which was occupied by the medium. There were present, waiting for us, about a dozen people, all elderly, all Cape Dutch and belonging, I judged, to the shopkeeping class. The medium was a stout Dutch woman of about fifty. I was a little surprised at the lack of cordiality in my reception, for the 'Afrikanders' are a notably hospitable people. But when my host introduced me to the medium, she merely nodded and turned away to continue her conversation with someone else. The others gave me a perfunctory 'Good evening' in Dutch, and paid me no further attention. My host conversed with friends, and I stood about waiting for the proceedings to begin. I realize now that they may have been all a little annoyed with my friend for having introduced on impulse, a complete stranger to their very private circle.

After about five minutes the medium sat down in her chair, and the rest seated themselves on the long benches. They did not, that I can remember, put their hands on the table, they simply sat staring straight before them. I took my seat last, farthest from the medium, with my host next to me. Someone turned the single lit gas-jet slightly down. The light remaining was enough to render all persons visible, without my being able to see their expressions. There were no preliminaries. The medium lay back in her chair; and, less than two minutes later, spoke half-a-dozen words. One of the figures opposite to me turned its head towards the medium and answered tersely. The medium replied with equal brevity. The sitter made a noise which sounded like assent, and *that* bit was over. To my disgust, I realized that all the proceed-

ings were going to be conducted in Dutch, and that my knowledge of this language was insufficient to enable me to understand what was said. After a slight pause the medium spoke again and another figure turned its head and replied. This time the interchange was even briefer. No emotion here, thank goodness! Another pause. Then the medium startled me by speaking very loudly in a harsh, man's voice. She produced a quite long sentence, and during its course all the figures turned their heads towards her. When she had finished, they returned the heads to normal and sat staring at the table. None answered.

A pause followed. Then my host leaned towards me. 'Do you understand what she is saying?' he asked. I shook my head.

He translated slowly and carefully. 'She says that there is a young man here to-night who will be the greatest medium *that the world has ever seen.*'

It took a few seconds to soak in. I ran my eyes over the two rows of sitters searching for this young man whom I had overlooked. But there was nobody there under forty. Slowly it dawned upon me, to my extreme embarrassment, that the medium was making this monstrous statement about *me.*

I found it incredible because I had never perceived in myself the slightest trace of real mediumship. I was perfectly normal. I was quite unimportant. I was merely the *me* I knew so well: a person whom it would be the acme of absurdity to attempt to fit into a picture of that kind—a person to whom things like that did not and could not happen. I was embarrassed because everyone is embarrassed by flattery which is patently ridiculous. I was uneasy for another reason. I knew that all spiritualists encourage beginners with promises of impending mediumship if they persevere; but I knew also that, in the spiritualist's religion, the greatest mediums of the past were the famous *Biblical* characters. Those who were

non-Christians ceded the palm to Jesus of Nazareth. Those who believed that Jesus to have been no medium, but Divine, would uphold the claims of Moses or Isaiah. (These Afrikanders would be in that category.) Some held that Buddha was greatest of all. Hence, to say of any untested stranger youth that he would be the 'greatest medium the world has ever seen' would be an enormity which no pseudo-medium would dare to commit. And these silent figures knew it, and were waiting for my answer. I glanced furtively at them again. Their eyes were fixed upon the table. Presumably they did not wish to add to my discomfort by looking at me.

They were waiting for my reply. 'Ask,' I whispered to my host, 'if he will be a materializing medium.' In my flurry I could think of nothing else. The question was put. The answer I can describe only as a veritable roar of indignation, loud and prolonged. My friend turned to me rather hastily. 'He says,' he explained, 'that it will be nothing of *that* sort at all.' In the inflexions of his voice he conveyed perfectly the contempt that had been evident in the 'control's' reply. Another sentence or two followed; but the voice was dying away. My friend translated rapidly meanwhile: 'He can't explain what it will be'—'It won't happen for a long time yet'—'But you must give up smoking.'

I paid no attention to this last injunction. The 'control' had evidently departed, and the medium was returning to her normal trance state. The prohibition on smoking is merely a classical tenet of spiritualism, something that has been inherited from the early beginnings of that cult among people to whom smoking was a vice second only to drinking.

Nobody moved. The medium spoke three or four words in the voice she had used at the beginning. Someone gave a kind of grunt. A pause. The medium sat up. The séance was over. It had lasted perhaps five minutes.

The light was turned up. The sitters began to leave the room. They chattered to each other as they went. Two or three were talking to the medium. None even looked at my host or at my frowning, perplexed self; and for this last I was most thankful.

My friend accompanied me to my tram. I suppose we must have talked on the way; but I can remember only vaguely the tenour of that conversation. I was deeply puzzled as to what form this alleged mediumship was going to take. My friend could not imagine what it would be. I was pleased that it was not going to happen for a long time, so that I need not bother about it; and I think he agreed that to 'forget about it until it happens' was the best policy. When my tram arrived, I thanked him, and he shook hands and departed. He did not ask me to come again. That also was odd; but I was pleased; for I should have refused. I had had enough.

But if my friend is still alive and reads this, I should like him to know that I am most grateful to him. For that prophecy helped me greatly to preserve my mental balance later on when some of the events prophesied actually began. I took them as a matter of course, and was not in the least perturbed.

In analysing this occurrence, we must bear two points in mind.

The first lies in the use of the word 'medium'. Employed by a spiritualist, it means a person who is susceptible to intrusions (usually mental intrusions) by another person. Now, no element in the serial time extensions of the person intruded-upon can see, prophetically, that such an intrusion will occur: foreknowledge of that intrusion could pertain only to some element in the serial build-up of the person intruding. Consequently, if the prophecy in this case turned out to be true, it could not have been the work of my unassisted subliminal consciousness.

The second is that all *questions* to a supposed 'control' have to be delivered *via* the medium, whose subliminal depths will *expect* the answer to be of a particular nature. The sudden, startling announcement made by the supposed 'control' in this case came, so to say, 'out of the blue', and it is almost impossible that it could have been *expected* by the medium. Studying what the 'control' said in this case, one sees the interference by the medium very clearly. The 'control' began by announcing something utterly incredible to the listeners, and this in a single, short, concise, unequivocal, authoritative sentence. In answer to the first *question*, the reply is slightly vaguer and it is redolent of the medium; for a trance medium would be disposed to look upon materializations with unmitigated contempt. The remaining remarks were not only evasive but definitely of a 'hedging' character. She would not say what kind of mediumship it would be. It would not happen for a long time yet. It would not happen at all unless I gave up smoking. All, obviously subconscious 'face-saving'—lines of safe retreat if the prophecy were not fulfilled. One might suspect shrewdly that the medium was horrified at her indiscretion in allowing so rash, incredible and blasphemous a statement to *slip through*.

Whether the prediction at the Mowbray séance was or was not an intrusion depends, as I have shown, upon whether the experiences which followed were intrusions. The prophecy was that there would be intrusions, and none but the intruder can prophesy that. So we must leave this particular question in abeyance, until we can decide whether the prediction was fulfilled.

But you will have noticed that I have begun to construct a *thesis*. It would be as well, perhaps, if I were to elaborate this a little before we proceed further.

Why was it that the 'control', having made his announce-

ment, did not proceed to disclose what more he knew? The answer I have given is that the medium shut him out. All experienced spiritualists know that every trance medium has a very clear idea of what is expected of her and of her duty towards her sitters. She is to produce messages from the *dead*, accompanied by evidence that will serve for identification. Any information which these 'controls' may give regarding the nature of the world in which they live must be in accordance with standard spiritualistic theory. Spiritualists know, also, that she cannot get those messages unless she shuts out all interruptions. I am pointing out now that, although the 'messages' she admits may be unexpected individually, they are all of an expected *class*, and that the barrier which she erects against 'messages' of an *unexpected* class is just as strong as are those muscular inhibitions which a 'planchette' user raises against an unexpected movement of that instrument. Consequently, 'messages' which are outside the expected class can get through only in the rare moments when the medium is off her guard, and must needs be very brief.

Now, if we assume, for the moment only, that the apparent 'messages' which came to me later were genuine, I must have been a medium. I was not a 'great' one, much less the 'greatest that the world has ever seen'; for the messages were got through only at long intervals and were very few in number. But I was a medium who had had a training entirely different to that which the ordinary medium or even seer undergoes. I was, to begin with, extremely hostile to messages from alleged dead persons. I have given my reasons for that. So I could never have become a great spiritualistic medium. But the essential difference between myself and most of my predecessors lay in this: *I had discovered the dangers inherent in expectation, and had erected a firm barrier against that which was expectable.* At the same time I had a very strong belief that there

was something wanting, something overlooked, in all our sciences, philosophies and religions. So, *I had no barriers up against the unexpected.* Now, to shut out firmly everything which is expectable while keeping the door open for anything which is logically unexpected must be a very rare attitude in any medium or seer. And what an opportunity it must offer to any intruder who has a message of an unexpectable character awaiting delivery.

I do not attach much significance to the words, 'the greatest'. As I shall explain later, messages from any being which can foresee and predict coming intrusions would be conveyed to the medium's four-dimensional consciousness by simple thought-transference—which means that they would be conceptual in character. She would have to put the concepts into words of her own language culled from her own limited vocabulary. In the present case the words chosen by her had to be re-translated into English by my host. Cape Dutch is not a tongue rich in shades of meaning; and, if the tenour of the message had been, for example, 'one of the most unusual', this easily might get altered into, first, 'the most remarkable', and then, 'the greatest' in the course of the double translation.

I imagine you must be tired by now of the shy, emotional boy and the determinedly self-toughening youth. Neither ever departed completely. The boy remained, with his queer insight and his almost impish refusal to be overawed by great names. The youth was always there, a potential danger with his craze for adventure of any kind. But both fell under the control of an admittedly much duller individual: one who had learned, in the field of serious Chess, the hyper-caution and almost irritating patience which only chess-playing can confer, and, in the literature of Science, the respect for hard

facts and mistrust of wishful thinking which science alone can bestow. A heavy fellow—as the structure of that last sentence shows.

Ah me!

CHAPTER VII

I have warned you that the unrealized power of *expectation* lies at the bottom of the vast majority of supposed messages from 'another world'. So potent is this power that one should mistrust always the claimed origin of any message the tenour of which is expected. But there are other characteristics by which one may be able to recognize sham 'messages'. They may be, and usually are, verbose—they employ unnecessary words and even strive after eloquence. They may be, and often are, equivocal, admitting of two or more interpretations such as e.g. 'He is alive'. (For if 'he' turns out to be alive in this world, the medium has scored a great success: if he is dead, no harm is done, the medium is merely comforting you with the assurance that he is alive in the 'other world'). Finally, they may be (and this is the most crucial test of all) lacking in decision, vacillating, pleading difficulty in expression or the recipient's inability to understand.

Now, since those are the marks of the sham message, we should expect to find in any real message precisely opposite qualities. It should be laconic, assured and completely unexpected: as was the initial announcement at the Mowbray séance. I suspect that all genuine messages are like that: something which has found a momentary gap in the welter of rubbish circulating within the medium's mind, and has jumped through before it can be examined and rejected.

Now, the succession of dreams which led me to the sus-

picion that the queer 'serialism' in our conception of time—noticed when a child—might, after all, possess significance, began with a dream about a watch which had stopped. It is described, like the other dreams, in *An Experiment with Time.* You will remember that my watch had stopped at half-past four in the middle of the night, and that, at that moment I dreamed that I was looking down at that watch in my hand and noticing with surprise that it had stopped with the hands set at half-past-four. It became clear, later on, that this was the first of a series of pre-cognitive dreams, i.e. dreams caused by something which I was going to experience in waking life, later on. Now, it was certain I was going to see that stopped watch sooner or later; but it was also practically certain that I should, in the morning, *remember nothing of the dream.* Therefore, action had to be taken to ensure that the connection between the dream and the subsequent waking event should not, through this forgetfulness, be missed.

In *An Experiment with Time* I wrote:

'The dream had been a peculiar one (in ways which have nothing to do with this book) and the net result of it all was that I lit a match to see whether the watch had really stopped.'

Curiously enough, nobody has ever asked me what were those undescribed 'ways' in which that dream had been peculiar.

This is what happened:

In the dream, at the end of it, I was looking down on the stopped watch lying in my hands. At that moment I became aware of a growing din made by an immense multitude of voices. They were all shouting at me—shouting in the wildest excitement—but there was no unison in what they cried, and the clamour was a veritable babel. Then, as the visual part of the dream began to fade, someone said, 'That will do!', and the babel ceased for an instant. 'Now, then!' he cried, and all

the multitude shouted in unison, '*Look!* . . . *Look!* . . . *Look!* . . . *Look!* . . . *Look!!*'

And I awoke with the memory of those voices almost ringing in my ears.

Naturally, I struck a match and looked.

Now, voices heard waking are usually hallucinations, i.e. psychological misinterpretations of sounds actually heard owing probably to some aural defect. But there is nothing abnormal about voices dreamed-of. It is the commonest thing in the world to dream of people talking. The voices heard in my dream seemed to me to be mere unimportant trimmings in a fantasy which, like all other dreams, appeared to be entirely of my own composition. What interested me was (as I discovered next day when I reset the watch) that I had, apparently, *seen* the watch at the moment when it stopped. That, as you will remember, was a complete fallacy. But it led me to the suspicion that the mediumship predicted at the Mowbray séance was beginning. I remembered, however, that the mediumship in question was to be something quite exceptional. Merely seeing a stopped watch with one's eyes shut was a long way removed from that category. I assumed, therefore, that the whole episode was nothing more than a preliminary symptom, and that I had best not bother myself about it, but wait for something better.

The babel of voices was not present, of course, in that waking experiment with my watch which is the next incident chronicled in *An Experiment with Time*. In the dream of the arrival of the 'Cape to Cairo' expedition at Khartoum, the effect was slightly different. I 'awoke' (that is the only way I can describe it) from a less vivid and immediately-forgotten earlier dream to the dream about the three men, and I had an instant's impression that there had *been* talking—bothersome talking trying to engage my attention. I brushed it aside

because I needed my full attention in order to understand the inexplicable presence of those three khaki-clad figures in *North* Africa when it was, so obviously, to *South* Africa that they belonged. I felt that I had 'awakened' because (a) the scene was extremely vivid, and (b) I was examining it with *critical* attention—I was puzzled, and felt that these presences needed explaining, whereas in an ordinary dream one accepts the oddest things without question. The voices were present, and very clamourous, in the first half of the Mont Pelée dream, and here again I had the impression of having been awakened. This impression was much stronger in the dream of the Parisian factory fire, and I could still hear the voices dying away while I stared at that queer lath-like thing waving up and down. My critical faculties had been fully aroused and I puzzled over that waving lath until, *in my dream*, I succeeded in identifying it with the jet of a fire-engine seen through smoke in a film exhibited (in waking life) at an earlier date. The babel was completely absent in both the Horse dream and the dream of the aeroplane accident. But, in the dream of the wreck of that famous train, the *Flying Scotsman*, just north of the Forth Bridge, it was present in full force. And, this time, words could be distinguished. In the report I wrote: 'The scene came and went several times, but the last time it came I saw that a train going north had just fallen over the embankment.' The voices kept up a continuous clamour through the earlier part of all this; but, just before the scene reappeared for that last time, they quieted for a moment and then shouted, 'Look! . . . Look! . . . *Now* look!' I looked, and saw what I have described in the book.

This time those voices impressed me as being veritable intrusions; and I asked this apparent multitude of experimenters, 'When will it happen?' The visual part of the dream had vanished by then, and I was dozing in the dark with my eyes

shut. I *heard* no voices speaking in reply. By that I mean that I had no sense-based percept of speaking voices. But one can have memories of voices, which means, one can observe the 'memory-image' of a voice which has sounded and ceased to sound. I was aware of the continued speaking of voices which had that much but not more objective reality, and what they said was, first, 'Somewhere in the Spring', and finally, 'The middle of April'. My sister, however, declares that I told her next morning that the date would be the middle of March, so, although I am sure I am right, I was unable to claim in the record that I predicted the date with any greater precision than 'somewhere in the Spring'. The dream was in the previous autumn, and the *Flying Scotsman* was wrecked on April 14th at the place and in the manner seen in the dream.

Here again, in *An Experiment with Time* I made no mention of the voices. The reason is one which every man of science will understand. By the time that book came to be written I had succeeded in exhibiting beyond all possibility of denial the 'serialism' which lay concealed in both the classical and the modern physicist's conception of time, as well as in the hazy notion of the man-in-the-street. The proof, when found, was simple: the greatest difficulty of the whole business had lain in the discovery of that proof. Thereafter I had found that this serialism involved Man's immortality and the existence of that Universal Mind we call 'God'. The whole constituted a purely logical discovery of such overwhelming importance to mankind that the evidence for precognition provided by the dream experiments faded into insignificance before it. And it had been made without reference to those dream experiments. Even if these had failed, that would not have affected the greater discovery. Their only value was that they supplied some not strictly needed corroborative evidence for any who might say, 'But this serialism means that

everyone has secret precognition of what "lies ahead" of him in first-term time, and can take steps to alter it. One would expect such universal precognition to manifest itself frequently in ordinary dreams; but there is no evidence that it does so.' *Answer:* On the contrary: there is plenty of such evidence; and here it is. But if the dreams are of such minor importance in this great matter, the question of whether I did or did not receive promptings from outside sources which enabled me to *notice* my own dreams is a purely secondary matter and of no importance whatsoever to the great theory under discussion. What was important was to keep the main line of the investigation entirely clear of such irrelevant issues.

Now, I suspect very strongly that the voices were 'intrusions' by something which exhibited itself as a multitude. But I feel absolutely assured that, if that multitude did intervene, its object in so doing was to set me on the path which should lead me to a re-examination of that serialism of time which I had noticed as a child, and that they were not interested at all in providing the very weak evidence of their own existence or of (what comes to the same thing) my very feeble 'mediumship'.

But now the case is entirely different. Here we are not discussing the validity of serialism: we are assuming that to be established. That involves that we are assuming the existence of serialism's 'Universal Mind' which *can* intervene *via* those aspects of itself which are *our* minds. Serialism, of course, cannot say whether that Universal Mind does in fact avail itself of its capabilities in this respect. And what we are trying to ascertain is (the foregoing being presupposed) whether certain incidents show any signs of being such interventions. Now, there is no *three*-dimensional Universal Mind in serialism: Mind, Universal or individual, does not enter the picture until we come to consider the four-dimensional world.

Consequently, if the Universal Mind wishes to intervene in the workings of any particular human mind it will do so by affecting that human mind's four-dimensional being—which is a little bit of the great four-dimensional network. The instruction to 'Look! . . . *Now* look!' would have been conveyed, presumably *wordlessly*, to my four-dimensional being, and then translated by me into the nearest words in the English language which would cover the sense of the instruction. So no evidence implying activity of my private four-dimensional being, such as, e.g. language employed, grammatical errors, limitations of vocabulary, use of favourite phrases, etc., would have any bearing on the main question. My four-dimensional being would be bound to be implicated in any case; and what we have to judge is whether it was implicated as accessory—whether, in short, it translated and delivered a message it had received, or composed that message itself. And our only guide here is the nature of the message. The experiments which gave the book its title showed that I was having precognitive dreams with considerable frequency, but was, like everyone else, forgetting them on waking, or failing to notice, later on, their resemblance to the associated waking event. Now, all the voice messages were directed towards the overcoming of those two difficulties. It was essential, in the first example, that I should wake at a particular moment in the dream, and then look at the real watch without delay. It was essential in both the 'Cape to Cairo' and the Paris fire dreams that I should pay special attention to what was happening, so that I should recall this on waking. That, also, was the apparent aim in the Martinique dream. In the case of the Horse dream, where there were no voices, interference was unnecessary; because a nightmare always wakes me and I do not forget it easily. That dream was the one which gave the whole show away. The

subsequent dream of the aeroplane smash was, obviously, not suited to the purpose I am hypothetically, attributing to these intruders, and there was no sign of interference by these. Their final appearance in the dream of the *Flying Scotsman* was, presumably, because this was an absolutely first-class example of what they had succeeded in making me realize—the fact of dream precognition—and so a good ending to their job.

They never appeared again. They had occurred in, at the most, five of the seven dreams which preceded the experiment; but in all the dreams which were recorded subsequently there was no sign of them. That is what one would have expected. For their function or, at any rate, their effect was to arouse attention so strongly that the dream was remembered. During the experiment itself the special method employed for recalling forgotten dreams and comparing these with subsequent waking events made rousing of attention by an outside agency quite unnecessary—and, indeed, such an occurrence would merely have confused the issue. But the crux of the whole matter lies in the nature of that 'rousing of attention'. When your four-dimensional personality is what we call dreaming, its *intelligence* is usually not at its best. It inspects quite uncritically and incuriously the congeries of images selected by its own fatuous, 'face-saving' subliminal depths; and the methods it devises for dealing with the dream situations presented to it are puerile in the extreme. If you will look back at what I have written a little earlier, you will note that the effect of the voices in four of the five cases described was to arouse the idling *intelligence* of the complete four-dimensional creature. It (the creature) became surprised at what was happening; its curiosity was excited; it sought for explanations; its critical faculties were hard at work: in brief, its whole intelligence was as much alert as would be the in-

telligence of a normal individual confronted, in waking life, with similar odd scenes. Now, *something* said to this four-dimensional creature, 'Look! . . . Look! . . . *Now* look!' One does not say that to oneself when one is already looking. And what the creature was urged to do was to look critically and *dubiously* at the silly images its subliminal stratum was playing with—things which up till then it had accepted with the placid acquiescence desired by that subliminal part. The instructions which urged this rebellion against its sillier stratum would not be instructions originating in that stratum, although they might, of course, have affected that stratum first *en route* to the more intelligent parts of the whole individual. So there must have been intrusion from something outside the *whole* four-dimensional creature—something, moreover, which was working with extreme cleverness and extreme patience (it had to wait years between each suitably dramatic dream) towards a desired end. When that end was achieved, which was when the precognitive elements had been clearly perceived, and experiments devised and started, its work was done. It stood aside, and left the rest to the commonsense of a man who had been trying from childhood to discover some significance in the apparently meaningless Regress of Time.

I must repeat here (because this is very important) that the fact that the intrusions in this particular group of dreams took the form of a multitude of voices is entirely without significance in the question of whether these were, in fact, intrusions. The *voices* were, obviously, of my own imagining. One cannot conceive four-dimensional entities, equipped with facilities for that mind-sharing which is 'telepathy', and experienced in the use of those facilities should continue for long to find it necessary to express their thoughts in words. But, as explained in *An Experiment with Time*, a four-dimen-

sional individual whose three-dimensional self is still living has not yet learned to clarify its thoughts without the use of words learned from that three-dimensional self. So the intruding instruction probably would be sent telepathically and recorded by the receiving instrument (me) as words. Or, to put it more clearly, I should become aware that something wanted me to do *what I should call,* 'Look' or, ungrammatically, '*now* look'. Note that, although the instruction seemed to come from many, that 'many' spoke *in unison*—spoke, that is, as *one* voice. The crowd, like the words into which I translated the impulse I was receiving, was *my* contribution to the phenomena. Perhaps this will help you to understand how it is that professional trance-mediums, if genuine, contrive, nevertheless, to introduce absurdities like Indian children as being their 'controls'.

I am now going to describe to you four apparent intrusions of a much higher quality. The first of these was silent—for I was awake. The other three occurred in dreams, and here the messages were so clear that I was able to translate them easily into the appropriate words. The effect then was that of a single voice speaking to me, and I attributed that voice to an imagined appropriate individual. But the thoughts expressed thus in words were far beyond anything that my dreaming four-dimensional being, with its feeble reasoning powers, could have achieved for itself. And what was 'said' was short, concise, authoritative and, even to my waking intelligence, utterly unexpected.

CHAPTER VIII

You will remember that at the end of the Jekyll-Hyde episode, I dug for myself a trap in which I remained caught for 'ten uneasy years'. I wanted greatly to believe in the Divinity of Jesus of Nazareth. Genuine affection and admiration was at the bottom of that. Reason refused permission. To save myself trouble I promised God that I would believe if a certain event happened. In other words I forgot the injunction: 'Thou shalt not tempt (which means "test") the Lord thy God', and tried to rid myself of the onus of making what should have been a logical decision by appealing to an 'oracle'—namely, the occurrence of an improbable event. The oracle answered in the affirmative—and reason refused indignantly to be subservient to an oracle. I have pointed out that the ten years of shilly-shallying which followed were of high educational value in that they caused me to develop a temperamental horror of leading anyone else into the same trap, i.e. of asking anyone to base his religion on anything less rock-like than cold, unsupplemented reason. I am not asserting that this is the only proper method of approaching religious problems; I am not denying to anyone the right to base faith upon 'inner conviction': but, I do declare once more that, for the work which, shortly, I should be called upon to undertake, this extravagant terror of misleading was an indispensable attitude of mind.

would have accepted release from none save Him to whom I had vowed.

In the three remaining occurrences I have to relate, there was a single voice.

CHAPTER IX

The intelligent part of me 'awoke', alert and curious from a duller, forgotten dream, to a vivid scene which appeared to be of a purely allegorical character.

I was sitting in bright sunlight on a rock half-way up a gently sloping, sandy hillside. At the bottom of this declivity there ran a brook. I was dressed, somewhat to my annoyance, in the attire of one of Mr. H. G. Wells's 'Samurai' as these are pictured in his book, *A New Utopia.* Two lines of Longfellow's hymn, beloved in spiritualistic circles, were ringing in my head: the ones about great men leaving footprints in the sands of time. I saw that my own tracks were leading up from the brook's edge to the place where I sat. Obviously, I was dead, and the brook was the allegorical Jordan. I experienced a mild thrill, succeeded by a flare of anger, for I knew quite well that I was *not* a great man and suspected that I was being fooled. The other side of the brook represented evidently the world I had left, and I looked at it to see where my footmarks entered the water; for I had a horrifying idea that I might discern (*vide* the poem) a string of idiots following them. But the whole of that world lay in shadow, and, although I could perceive numbers of people moving about therein, none of them was clearly distinguishable, and any footprints there might be were quite invisible.

The deep shadow was contrasted so strongly with the brilliant sunshine in which I sat, and ended so abruptly at

the water's edge, that I became puzzled as to what might be the cause thereof. Then it dawned upon me that, about a hundred yards to my left and slightly behind me *God* was sitting working with bent head at something of which I was ignorant. I did not see Him because I could not turn my head: I merely knew that He was there. The whole scene was as silent as a picture. And the shadow which lay upon the world was the shadow of God.

I must emphasize that I was, from first to last, fully aware that the entire vision was purly allegorical, and that all the images therein were merely conventional symbols. Had there been the slightest attempt to suggest to me that any of the figures were veridical—e.g. that God was a Male Worker—I should, probably, have shied away from the whole.

I was deeply puzzled about one thing. *God's shadow was lying over the whole world. Then why did not those blind fools see it?* As I asked myself this, I became aware, abruptly, that two yards to my left and just behind the limit of my field of sight, there was standing—an allegorical Angel. Do not ask me what he looked like; for that is quite unimportant. He symbolized something which could be questioned. And I fitted him with an allegorical make-up which would be in keeping with the rest of the vision. I made him a conventional Angel, tall, dark, beardless and attired in a long white garment. But I was not interested in him. Wild curiosity held me in its grip. I called to him and pointed. 'Look! look!' I cried, 'God's *shadow*! It's everywhere! It's all around them! Why, why don't they see it?'

I had expected that the reply would be something conventional about their being too much absorbed in their own, worldly affairs; and if that answer had come I should have discredited it; for my sympathies were with these people, and I knew that many of them were searching everywhere for

evidence of God's existence. But the answer which came—came immediately in five, short decisive words—was completely unexpected.

'*Because it has no edges,*' said the 'Angel'.

And I found myself wide awake—really awake—and memorizing carefully every detail of the dream. Of course, I saw at once that what the 'Angel' had said was true. It is psychologically impossible to be aware of anything which 'has no edges'. To realize the existence of this or that there must be a 'not-this' or 'not-that' with which to make comparison. As for the dream, it meant obviously that there was no place in the whole world where God is absent. Consequently, it would be useless to search anywhere for *evidence* of God.

There is, however, something else about that allegory which is important. It did not preach Pantheism. God and the world were not one and the same thing. But His shadow covered the world; which means that His Spirit or Mind pervades a physical world which is neither Him nor that Spirit.

This dream occurred in 1905, twenty-two years before the last chapter of the first edition of *An Experiment with Time* was written. Naturally, I was immensely pleased when it became evident, during the writing of that chapter, that the hypothesis of a single, space-filling Mind was a reply—and the only possible reply to the appallingly difficult question of why minds *not subject to brain's mechanical trammels* should appear to cling to the particular world-lines of particular brains. The discovery of that reply was a tremendous logical achievement, and I seemed to have effected it, at that moment, unaided. But I must give the 'Angel' his due: he, twenty-two years earlier, had shown me the possibility of there being a world-filling property of 'God'.

Twenty-three years were to elapse before I met this im-

agined 'Angel' again; and, during that interval, the shouting of the multitude returned—once only—in the dream of the *Flying Scotsman.* The difference between the clear, assured speech of the 'Angel', and the semi-incoherency of the crowd was an extremely curious thing. It was difficult to suppose that the same agency was at work in both cases. The motives involved appeared, moreover, to be entirely different. The object of the noisy outbursts was always the same: to arouse my critical attention to some precognitive dream which, otherwise, I should have missed, and then to awaken me. The intention of the 'Angel' appeared to be to convey definite information about matters of far greater import. I realized that I should need to be particularly cautious about that 'Angel'. He was so obviously a creature of my own imagination, constructed to accord with the supposed information he was conveying; and there was a risk that it might be my own imagination also which was supplying the *tenour* of his message—the *words* he used were clearly of my own supplying. Moreover, I had no intention whatsoever of being led to base anything approaching a religion on nothing beyond supposed 'revelations': I knew too well what were the dangers there. Finally, I decided that if he came again, I should pay great attention to all he said, and treat it as a possibly valuable pointer as to a direction in which it might be profitable to direct philosophical research. There could be no danger in that. But uncritical credence—*no*!

CHAPTER X

I know of no writer who arouses in one such enthusiastic agreement or such horrified dissent as does my old friend Mr. H. G. Wells. As a Prodder of Lethargic Minds he has no equal in history, and some day history will recognize what we owe to him in that respect. Now, it happens that in 1928 he wrote a book entitled *Mr. Blettsworthy on Rampole Island.* This prodded me into a condition approaching panic. It was so obviously true that the Human Race might prove quite easily to be the greatest of all the many failures that Nature has achieved. Man, whom we regard as Her greatest success to date, has not been here anything like long enough to enable us to predict his future with assurance. Perils of every description lie ahead in his possible paths; and not the least of these is a danger which a younger H. G. Wells was the first to point out and which has, since then, never ceased to haunt my imagination.

There has been a considerable increase, lately, in the number of those who profess to be aware of the dangers inherent in another world-war. It would, they say, destroy Civilization. Yes, and then? Most of us are hazy about that 'and then'. The Nazis, for example, were quite willing to visualize a return to the days of the Teutonic Knights, a world of drinking, feasting, pillage, rape, torture for amusement, and enrichment by the labours of innumerable slaves living at starvation's edge. Mussolini would have had no objection to

raise against a retrogression to the days of the Roman Empire. In England there are many who imagine dimly that the collapse of civilization would involve something like a return to the days of King Alfred. The Americans—oh well, perhaps a revival of the days of the early settlers and the log cabin—with or without crooners specially preserved from destruction.

It is fairly safe to say that there would be none of all that.

A complete breakdown of civilization in another world war would mean, for the vast majority of mankind, a complete cessation of the food supply. That majority would perish out of hand. The few who grew food just outside their own doors would be in little better case. No artificial manures obtainable to renourish the worn-out soil. No renewal of spades or forks or any metal implement. Forests burned, the earth's surface peppered with anti-agricultural viruses designed to spread like pestilences. No, it is more likely that we should all go right back to the days of Primitive Man.

But this new Primitive Man would have none of his remote ancestor's chances of survival. No vast forests teeming with game: we have cut down most of the forests and destroyed nearly all the game, and fire and poison gas would have completed that devastation. No rich, virgin pasture lands. Even now soil erosion due to deforestation, and the resulting invasion by the desert in the guise of sandstorms, are menaces which are winning despite the resources of modern science. The spreading of desert is a thing which develops at increasing speed, and that speed, to-day, is appalling. With the cessation of organized resistance, the semi-deserts we have started everywhere would become real deserts racing over the lands. Worse still, the new barbarians would be pitiful creatures completely lacking in the original Primitive Man's hardiness and power of resisting bacteriological attack. The

doctors, inoculating and preserving our weaklings to breed more weaklings, have seen to that. Moreover, the after-war world would be a vast pestilence-house of malicious, laboratory cultivated diseases, contagious beyond description. And there would be no serums or even medicines available for the civilization-pampered bodies. Finally, there would be, almost certainly, ovary-attacking bacilli to hinder reproduction. We may abandon the notion of any Phoenix-like re-emergence of the Civilization that Failed. The New Primitives would regress; and the spreading deserts would forbid recovery.

Very well, assume that we remain, generation after generation, sufficiently alive to the perils of another total war. What is the opposite danger?

H. G. Wells was the first to indicate this—in a single, unforgettable page of that gem of imaginative writing, *The Time Machine*. The 'Time Traveller' has reached the Sunset of the Human Race; and he sits musing in bitter disappointment. Everywhere are lovely creatures, flawless, exquisite as fairies, happy, laughing, weaving garlands and hanging them about each other's necks, joining hands and dancing, *witless and incapable of sustained interest.*

They are the consequences of the cessation of the need for struggle.

I have written something on that subject myself, albeit in duller language. This, for example:

'What do most people mean by adventure? When they talk of adventure they lose sight of the kernel of the thing through over-attention to its various attractive trappings. They would say that most animals are adventurous. For animals chase each other, taking, apparently, as much delight in being the quarry as in playing the hunter. Obviously their antics satisfy some deep-seated urge and they are exer-

cising very strenuously certain abilities with which they have become endowed in the course of evolution. The exercise of latent power is always intensely satisfying; and the denial of opportunity for such exercise is definitely injurious to mental health. Now, love of fighting and hunting is not at all the same thing as love of adventure. An adventure is essentially an *unexpected* experience. Actually, the lower animals are bundles of habits and dislike novelty. Men, however, are different. They are equipped with a very remarkable power —the power to keep their heads in novel situations and to devise swift plans for dealing with strange circumstances. Here, again, we have an aptitude which, if left latent, clamours for exercise. An adventurer is one who finds that clamour so insistent that he welcomes with rejoicing every kind of opportunity for employment of this highest of human powers. Both to the animal, fighting, and to Man, riding the storm of circumstance, risks are negligible compared with the enjoyment obtained from full self-expression.'

And again—to a correspondent.

'Consider what Man is! The air battles and the town blitzes have opened our eyes there.

'He is the most adventurous of all living things. He is the only one that revels in the challenge of a totally novel situation such as cannot be dealt with by automatic response. He is the only creature that can lay down its life for a complete stranger. He can find more pleasure in overcoming a difficulty than in the reward of that victory. He can find danger a cause for rejoicing. And, above all, he can find in moments of his own greatest terror an actual urge towards higher courage.

'Would it make for the happiness of a flaming soul like that if it were left with *nothing to fight against*—with no "evil" (in its sense) to defy?'

The evil (in its sense), referred to meant: anything hostile to Man as a whole.

In brief, suppressed mental distress craving mental anodynes and finding none save mental somnolence would be the first outcome of a civilization in which there were no risks to be run. But there would be another result, and this would lead to a situation far uglier than that which was pictured by H. G. Wells.

The flow of nervous energy in any system of nervous matter tends to follow paths of least resistance. A flow of that kind is called, of course, 'automatic'. Such automatic flows tend to become (in the life-history of the *genus* concerned) uncontrollable and unconscious. For example, your breathing is automatic, but it is quite controllable and, although it seldom engages your attention, is well within your field of observation. Again, the beating of your heart is automatic and uncontrollable, yet you can still, occasionally, be conscious thereof. But there are a great number of activities proceeding in your nervous system which are both completely uncontrollable and completely unobservable by you. In general, the procedure may be summed up thus: *Allow a specific automatic activity to function for many generations without frequent interference and it will become first uncontrollable and then unconscious.*

Now then: picture a civilization in which all stress, danger and difficulty in meeting daily needs have long disappeared; in which adherence to a code of mutual social respect coupled with mutual social compliance has become second nature to all, so that no individual suffers from lack of companionship or from rejected emotional cravings; a world in which music, art and entertainment are all State-provided and in accordance with the demands of the mediocre majority; a world in which 'flaming souls' would be shocking anachronisms. What would happen?

Man's marvellous brain would, of course, adapt itself swiftly to the new stereotyped conditions. Its response to each recurring situation would be perfect, and leave nothing for the mind to do. Mind could rest. It could sit placidly admiring the sycophantic activities of its mechanical servitor, the brain. There would be no longer the smallest need for mind's interference.

Let the Human Race continue in this condition without interruption from a conquered Nature. What, in the long run would be the result?

Man would become an almost entirely unconscious automaton.

Like the bee, he might still imitate, ritualistically, the intelligence he had once possessed. But that means merely that 'Ritual' would have been a major factor in his decline. Despite the appearance of motive, he would have become, inherently, as vacuous as the bee which buzzes itself to death against an unexpected window-pane. Nature, in her great experiment with the Human Race, would have reached one more blind alley. Ritual is the purely animal tendency to allow neural activity to follow a course which has been rendered, by constant repetition, the path of least resistance. Cultivated ritual, whether this lies in the negroid beatings of the tom-tom, in the stereotyped sequences of popular films, in the exigencies of 'fashion', in the 'proper behaviour suited to the circumstances', or even in the beauty of a Cathedral Service, *always wins if left undisturbed;* because it has prepared for the flow of nervous energy a path exceptionally easy to follow, and the following of that facile path is a restful and soothing process. In small doses it is a useful mental anodyne. In large doses it is a powerful hypnotic, with a strong drugging effect on the will. (The Fascists made great use of that in their youth-training.) But the end of any prolonged failure to control is inability to control, followed by complete un-

consciousness of the cerebral activity which is proceeding. And, for the man who is trying to rise to greater mental, artistic or spiritual heights, ritual is a clogging poison.

Dragoon Man into complete security, smother him with luxury, frown upon his birthright—the 'flaming soul'—warn him that the displeasure of the herd awaits any effort to be finer than the standard type, nurse him in his new captivity until the last vestige of rebellion has disappeared: the whirlpool life of Total Ritual to which you have condemned him will ensure that his degradation is completed in the shortest possible time.

On to turmoil and destruction! Forward to the Mindless Automaton! There is the Scylla and there is the Charybdis between which Man the Flaming Soul has to steer a course which Nature herself has not yet been able to discover.

Scylla is the nearest, now. We have to dodge those snapping jaws before we can give heed to anything else; and, fortunately, our ship's crew is in complete accord on that point. Unfortunately, however, the majority of them are clamouring for a helm hard down and a course—the shortest possible—laid straight for the centre of Charybdis.

If we reached that, what would it matter whether we circled there for a thousand years or a million years before disappearing down the vortex? We should have bungled the whole voyage, and *have missed making the open sea.*

What lies in the open sea? *All our hopes for the future of the Human Race.*

I do not believe that Man has reached his zenith. I do not believe that a woman moaning 'ye-ew' down her nose to the accompaniment of a tom-tom is the acme of musical achievement (and this notwithstanding the bandmaster's assurance that the nasal trouble in question is a 'great voice'). I do not believe that the Painter has no choice save that which lies

betwixt the Representational and the Disgusting. I do not imagine that the cigar-box indicates the apotheosis of Architectural Form. On the contrary, I hold that Music has barely unfolded its skylark wings, that Art has not yet wandered beyond the fringe of its powers, that Invention is in its infancy, and that the common man's ability to appreciate beauty is only just awaking from its natal sleep. And I believe that in those aspects of the Open Sea, the Flaming Soul will find satisfaction for its needs. For Creation—Creation untrammelled by tradition, unheeding the discouragement of the multitude, undaunted by the opposition of Nature—is the greatest of all adventures.

Oh, God! allow us to reach the Open Sea!

CHAPTER XI

On the night when I finished reading the story of 'Mr. Blettsworthy' I went to sleep feeling worried. Never before had I pictured Nature so clearly as a lunatic in a laboratory, wasteful beyond measure, making mixture after mixture aimlessly, and tossing aside those which displeased her. Never before had I realized how precarious was Man's very recent tenure of the Lady's favour. She might at any moment decide to put him in the melting-pot, or, relenting a little, to plant him on the shelf among the Ants and Bees. Uneasiness was an undercurrent in all my earlier dreams, and I tossed and turned a great deal.

Suddenly, I found myself apparently wide awake and—facing the 'Angel'. The 'Angel'—whom I had not seen for three-and-twenty years. We were on the same hillside; I seated on the rock, and he—a little nearer and more forward this time—standing on my left. But the scene was dark; so dark that, although my face was turned towards him, I could distinguish only a tall figure in the conventional white robes. His features were invisible.

I spoke hurriedly, for I was fully aware that this was a very rare and very fleeting opportunity, and that I must hasten to make the most of it. I poured out very incoherently all the doubts which had been troubling me, with special emphasis on my fear that we might become one of Nature's 'Dead Ends'. And I wound up with (every word is going to count

here), 'How can I be sure that it is going to turn out all right for us?', meaning by 'us', the Human Race. He was not so ready with his answer this time, and he waited for an appreciable moment, looking away to his left, before he said, 'Well, I can tell you this.' He turned his face towards me and continued very slowly and very emphatically: '*Always—remember —this:—Whatever—the game—is,*—YOU—*had—a hand—in—the* MAKING *of it.*' He paused to let this astonishing assertion penetrate, and then continued, '*Is it likely—that you would have made* it . . .' I interrupted here, speaking faster than he, and we both finished at the same time, I saying eagerly, 'yes, I see! "turn out wrong for ourselves?" ' and he saying, with slightly raised voice, '*turn out wrong for yourself?*' Then, while I hesitated on account of the slight uncertainty involved in his use of the singular and mine of the plural, he was gone—and I was lying in my bed, really awake, in the dark.

Now, this dream occurred shortly after the publication of the first edition of *An Experiment with Time*, so I was, already, aware that our individual minds were, so to say, shareholders in the great space-filling Universal Mind. It seemed to me that the explanation of what the 'Angel' had declared would emerge, probably, from a closer study of this mind-sharing business. That, however, would have to wait. For the 'wave-particle' anomaly and Heisenberg's 'Uncertainty Principle' had just come to the forefront in Physics; and these were so obviously instances of Serialism that the fact needed pointing out with the minimum of delay. *The Serial Universe* followed in due course, and was succeeded by *The New Immortality* and *Nothing Dies*. Consideration of the 'Angel's' curiously careful assertion was postponed from year to year; and, I fear, it would have been postponed during the remainder of my life had not circumstances compelled me to write the present letter.

On commencing that careful consideration, the first thing I noticed was, of course, that the 'Angel' had used my vocabulary and my phraseology. One would have to hunt a long way through the histories of Hebrew Prophets and Eastern Seers before one came upon an instance of an Angelic Being describing Life as a 'game', or Human co-operation with Deity as 'having a hand in the making of it'. That, however, did not trouble me, since I knew (*vide* my earlier remarks on this subject) that any message from beyond the recipient's own personality would be presented, in all probability, wordlessly, and be interpreted by the receiver into his own language. But this made it all the more odd that the 'Angel' should have refused to accept my 'all right for *ourselves*' and insisted upon his 'all right for *yourself*'. His aspect was, as said before, a pure construct of my own imagination and merely allegorical; his language was *almost* my own: but the respect in which the words differed stubbornly from mine involved more than the suggestion that the Vision had a will of its own—it introduced something which was, on examination, totally incredible to me.

I recalled here my original commonsense decision to neither accept nor reject these 'Angelic utterances', but to regard them as 'tips' regarding directions in which it might prove profitable for me to explore.

Proceeding on those lines of investigation, I found that in the 'Angel's' extraordinary reply there were four main points to be noted.

My question was: 'How can I be sure that it is going to turn out all right for *ourselves*?' The answer was, in effect: you can be sure because *you*, in the past, did something which would make it turn out all right for *yourself*. Now, this was not a reply to my question about it turning out all right for *ourselves*—except on one interpretation. That interpretation

involved that I was merely a representative member of the Race, and that what I had done to ensure it turning out all right for me was something which had been done or would be done by each of the other members to ensure that it would turn out all right for him.

Secondly, he agreed, tacitly, that for the Human Race to avoid Scylla and Charybdis and to reach the open sea (i.e. attain the zenith of its perfectibility) was the consummation to be desired; but he added that this would be turning out all right, not only for those living at the remote period in question, but also for those (e.g. myself) living now and so, presumably, for those who had already lived and died.

Thirdly, his question, 'Is it likely that you would have made it turn out wrong for yourself?' asserted that the action taken had been performed with foreknowledge of what the result for the performer would be.

The fourth point is not so immediately obvious. Compare, however, the two following sentences:

(1) Whatever the Play (i.e. theatrical performance) is, you had a hand in the making of it.

(2) Whatever the game is, you had a hand in the making of it.

The first sentence asserts plainly that you had a hand in the *composing* of the Play before the performance thereof began.

The second sentence differs from the first in the vital respect that a 'game' is not a *pre-arranged* sequence of moves or operations. It is something to be played; it may be lost or won; and it involves planning ahead *from moment to moment as the situation alters.*

Now, in Serialism, predestination is ruled out; because (*vide* Chapter II) mind is not subject to the particular mechanically determined sequence which governs a brain's world-

line, and it can always intervene to break that sequence and substitute another. For example, the sudden appearance of my own brain-line in the four-dimensional field, which was an event in time-2, must have been due to countless interventions—earlier time-2 events—by other people's minds. This means, of course, that I was, in time-2, a very recent addition to the ranks of the players. So the remark: 'Whatever the game is, you had a hand in the making of it', must have meant, 'Whatever the game is now, you had a hand in bringing it to that state'; and the continuation: 'Is it likely that you would have made it turn out wrong for yourself?' must have signified, 'Is it likely that the move (unspecified) which was your contribution to the game was a move contrary to your own ultimate interests?'

If you refuse to accept this view—that the 'game' referred-to is a continued striving towards some end, and that the steps needed to achieve success vary as the game progresses, —then you are driven back upon the assumption that 'game' was a slangy synonym for a predetermined march of time-1 'events', akin to the performance of a theatrical Play, and that, 'had a hand in the making of it', meant that we had taken part in the *initial* planning of that march—that we were, so to say, co-authors in the script of the performance. This would rule out the necessity for any subsequent (in time-2) interference by any of us, since the original plan, made by all of us simultaneously, would be the act which, according to the 'Angel', had ensured its turning out all right for us all. We should have nothing to do save sit tight and allow time-1 'events' to take their course; and any employment of our wills would be contrary to the wise dispositions of the leader of the planners.

I can see no reason for trying to envisage a set of souls sitting round a celestial council table and planning their sub-

sequent incarnations. Nor does Serialism provide the slightest encouragement to such a conception. It seems more probable that 'game' meant 'game' and not some kind of pageant. And on that hypothesis, Serialism and Relativity combined do, as we shall see in the next chapter, provide the explanation of the 'Angel's' curious assertion.

So much for what the 'Angel' said. But there remains something to be noted in what *I* had said. Why had I interrupted him so eagerly with that, 'Yes, I see!'? What was it that I had seen with such instant, delighted acceptance?

I must confess it. There had been, at that moment, no doubt in my mind. I *knew* that somehow, somewhere, sometime, we had all consulted together, that we had decided upon the steps to be taken, and that *I had agreed to my share in these.* And, looking at that delighted conviction in retrospect, I realize now that it was exactly *this* that I had felt in the last of those boyhood's ecstasies, when I had stared from my bedroom window towards the hidden multitude who were waiting to see if I should remember the thing I had always known.

But my utility pencil is running away with me. I am wasting good paper. Enough of mysteries! Let us get on with the explanation.

CHAPTER XII

I had given, in Chapter XXVI of *An Experiment with Time*, my reasons for supposing that we were all shareholders in one Universal Mind; but, in assessing the extent of that share, I had employed the utmost caution. My few personal experiences of 'telepathy' were not mentioned, and I had discovered no *logical* reason for supposing that our 'shares' extended to more than the streaks of Universal Mind which our personal brain-lines actually covered in the four-dimensional field. This, of course, limits the range of your personal attention to the sense data apparent in your particular birth-to-death streak. Any adventuring of your attention beyond the limits of that streak would be impossible unless the 'network' of genealogically connected brain-lines provided something akin to a 'travel-route', employable by consent of some hypothetical owner of the complete network envisaged as a single super-body.

When I began the present examination of the 'Angel's' seemingly crazy assertion, I found much that was unsatisfactory in this notion of a 'travel-route' along connected brain-lines, and I began to suspect that in imposing such limitations on our personal minds I had missed something which I ought to have noticed.

A few days later, I saw suddenly what seemed to be an appalling snag in any 'mind-sharing' theory of telepathy. Why is it that, although you may share telepathically another

man's sense data, your view of these never achieves the intensity which pertains to sense data when these are observed at the time-1 'now'? Why is it, for example, that you never experience, telepathically, another man's intense *pain*? I am not asking you to search for the answer, because I am going to give it to you in a moment; but, to ensure that you do not indulge in useless speculation, I must warn you straightway that the explanation is not to be found in any study of the 'nows' which pertain to hyperbolic space-time. I must warn you, also, against any supposition that the apparent anomaly in question is of negligible importance—a mere side issue to be dealt with at our leisure. It is quite vital; and this I could plainly see.

At the end of two days' struggling with this problem, I decided to give my mind a rest by switching its activities in another direction. A correspondent had written to me referring to a question in Bertrand Russell's philosophy; so, on retiring to bed that night, I took with me that author's delightful little book *The Problems of Philosophy* and started to read this for the third time.

On page 34, I came upon the following sentence:

'In one sense it must be admitted that we can never *prove* the existence of things other than ourselves and our experiences.'

I recalled then what I had written in the historical survey which forms the Introduction to *The Serial Universe*.

'There arose very quickly a critic who said in effect, "What is all this talk about a *collective* hallucination? *If* all that I can know directly are my sensations, and no external universe can be inferred from these: then I have no reason to suppose that there exists any mind other than my own. I am the only experient, and the hallucinatory external world is *my* world, and mine alone.' The logic of the argument

seemed to be unassailable. No answer could be found then: none was found later.'

In Chapter XX of that book I had dealt, I think, effectively with the type of 'Solipsist' who denied the possibility of inferring from his own sense data the existence of 'mass'. But —slowly it dawned upon me that I had *not* dealt with a more cautious type who chose to confine his denial to the possibility of inferring the existence of other *minds observing sense data.*

Well, that was an omission which easily could be rectified. I grabbed pencil and paper, wrote the fourth paragraph of Chapter II, and continued writing until daylight.

(Yes, Chapter II was interpolated after this book was nearly finished, and it was an indirect consequence of the 'Angel's' queer message.)

And now, if you will forgive me, I am going to make a most unusual request. Unless you are that superlative reader whom every author longs for but never hopes to find, you did no more than skim through Chapter II. In any case, you will, by now, have forgotten most of it. I want you to go through it again, slowly, from paragraph four to the end, and to do this before you read another line of what I am writing now.

Please accept my best thanks. I am not saying that in jest; for none knows better than myself how 'tough' that chapter is.

You will have seen now why it is that you cannot experience another person's pain, in the ordinary, intense sense of that word, and why you cannot deliver energy to, or receive energy from his brain by the direct, telepathic route. His sense data are intersected by your three-dimensional time-: 'now', which is a field covering all three-dimensional space;

but they are not at your three-dimensional 'here' in that 'now', which 'here' is the *only* such 'here' in the space with which *you* are acquainted.

When we turn to the consideration of your *time-2* 'now', we find that this is a field covering a world of four-dimensional space, and that this 'now' contains, in turn, a single, four-dimensional 'here', provided by your brain-line. That four-dimensional space, however, with its unique 'here', is only an *aspect* of a more generalized four-dimensional space in which other people's brain-lines constitute 'heres' which bring into being other aspects of that space. The generalized space and the aspects thereof are, of course, all equally extensive.

The Universal Mind fills all that generalized four-dimensional space, so that the spatial aspects brought into being by the various brain-line 'heres' are spatial aspects of the Universal Mind.

At this point, I think, our best procedure will be to leave these aspects awaiting clearer elucidation while we consider more closely what are the characteristics we are justified in attributing to 'mind'.

You will remember that we defined it originally as that which observes sense data as objects to be attended-to or ignored, and 'liked' or 'disliked'.

Now, in Serialism, as in every cruder philosophy, the very least that you can say about anything intellectually graspable is that it 'is'. Consider, for example, some such thing which, to avoid confusion, we shall refer to as x. If we say, 'x is—', and leave the sentence apparently unfinished, we have, certainly, said something about x. We have granted it what is called 'Being'. Moreover, what we have said is, despite its vagueness, the *profoundest* statement it is possible for us to make. To possess 'Being' is to possess the most *fundamental* characteristic of all; and our x will fall always into the bottom

row of compartments of the Serialist's table. Obviously, below 'Being' there can be only . . . Nothing.

If, however, we complete our sentence and say 'x is this or that', then we are *abstracting* from the realm of general, undefined 'Being' a kind of 'being' with definite limitations. This more clarified but (for that reason) more limited kind of 'being', must be tabulated in a row of compartments devoted to things *abstracted from* the vague realm of 'Being', which row is immediately above the row pertaining to 'Being' pure and simple. Items in that row are said to possess 'Existence', and our x—in the completed sentence turns out to be 'an Existent'. I am sorry to have to bother you with all this, and you need not try to memorize it; but it was necessary to enable you to understand the very important paragraph which follows.

In crediting mind with definite characteristics we are relegating it to the category of an 'existing' thing, instead of to the more fundamental level of that which has undefined 'Being'. This holds true of any mind that we can describe. Hence, in speaking of 'mind' we have *not* reached the, so to say, rock-bottom of the universe.

THE FOURTH INTRUSION AS RECORDED BY J. G. C. DUNNE

In the third appearance he described the scenery as having grown dark and stormy so that he could barely see the 'Angel'. In the fourth and final appearance it was pitch black with a raging tempest. All that he could see of the 'Angel' was a white something which he took to be his robe and which he caught hold of, for (here I quote his own words) 'I knew that it was the last time I should see him.'

This Appearance was very brief and I think it took him by surprise. He said that he thought rapidly for some question to ask the 'Angel'. The question which had always worried him came out—'Christianity, is it true?' and the 'Angel' replied: 'God lets it be true for those who want it to be true.'

He said that he had no interpretation of the 'Angel's' reply to his final question.

APPENDIX

Figure 9, below, is merely an elaboration of Figure 8, with the world-line *ab* inclined at 45 degrees to the fourth-dimensional axis. One of the three axes of three-dimensional space is intersecting the fourth-dimensional axis at *f*, and the world-line *ab* passes through that point. As in Figure 8, the B.1. space is *travelling* 'over' (meaning 'through') the A.2. World in the direction indicated by the arrows, which is the direction of the fourth-dimensional axis.

In Serialism we restrict the use of the word 'travel' to the meaning of movement by what is being treated as the real 'now-mark' in a dimension not included in the dimensions of its own structure. In Serialism, also, we refer to that world which is represented in the Table by the contents of compartments A.2., A.3., A.4., etc. as the 'substratum'. Thus, we say that B.1. is 'travelling over' the 'substratum'.

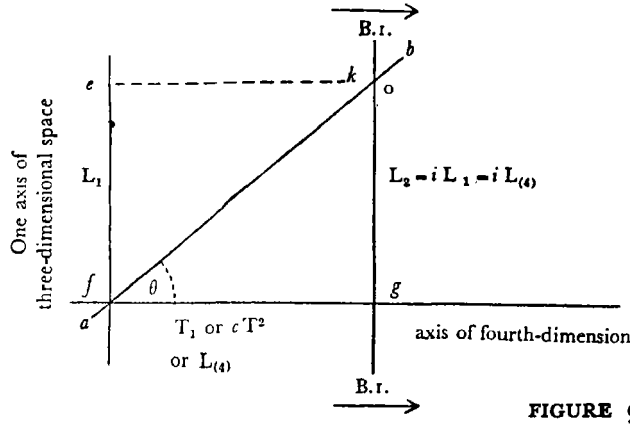


FIGURE 9

The world-line *ab* is that of a body which would appear (in the B.1. space) to be moving at uniform speed. The point in that world-line where it is intersected by the travelling B.1. is labelled O. When B.1. coincided with *fe* in the substratum, O was at *f*. As B.1. travelled forward, O moved up B.1. until it arrived at *k*. The speed with which B.1. travels is supposed to be uniform, and the result is that O moves up B.1. at the same uniform speed as that with which B.1. travels. O represents, thus, a small body moving at uniform speed in B.1. space.

On page 46 of the *Introduction* it was explained that 'Observer-2' is you utilizing the *full* four-dimensional view provided for you by 'now-mark-2' or C.1. In that view, B.1. appears as travelling along the fourth-dimensional axis, which axis, consequently, Observer-2 regards as a fourth *spatial* dimension forming with the other three dimensions of space an 'isotropic' four-dimensional continuum. We shall call the fourth-dimensional axis, as it appears thus to Observer-2, '$L_{(4)}$'.

'Observer-1', it will be remembered, is Observer-2 ignoring his four-dimensional outlook and confining his knowledge to what is presented to him in the three-dimensional view A.1. afforded by 'now-mark-1' or B.1. To Observer-1, the fourth-dimensional axis is a time-1 *extrapolation* of the changing world apparent to him as A.1. Observer-2 calls the $L_{(4)}$ axis considered as this extrapolation, 'T_1'; and his task, it will be remembered, is to ensure that $L_{(4)}$ (observed) and T_1 (calculated) agree.

At *kg* we have *two* lengths to consider: L_2, which is a length in the travelling B.1., and an L_1 which is a definite, static, cross-sectional length at that particular place in the substratum. It is easiest thought-of as 'underlying' L_2. The L_1 on the left of the figure is the projection, on to the corresponding axis, of the L_1 underlying L_2.

B.1. is travelling along $L_{(4)}$ as indicated by the arrows and

we are going to consider that portion of its journey which consists in its displacement from its past position at *fe* to its present position at *gk*. The length of $L_{(4)}$ through which it has been displaced has definitely indicated *direction*, and is, consequently, a 'vector' of displacement. As such, it can be represented in conventional fashion by a line drawn above that $L_{(4)}$ symbol which represents the amount of the displacement in question—thus: $\overline{L_{(4)}}$. We do not do this in the figure; because, as we shall see later, there are in that figure, two $L_{(4)}$s to be considered, and one of these is *not* a vector.

The significance of cT_2 I shall explain much later.

A vector has two characteristics. It has *length* (of displacement) such as can be indicated on a scale. This is its 'scalar' character. And it has *direction* (of displacement). The combination of the two is described completely if we multiply the scalar value by a symbol representing the *unit vector*. For example, instead of writing $\overline{L_{(4)}}$, we may write $\bar{\beta}L_{(4)}$, where $\bar{\beta}$ is the *unit* vector indicating *direction* of the unit displacement and $L_{(4)}$ is the *scalar multiple* of that displacement. Any line drawn parallel to and equal to $L_{(4)}$ anywhere in the figure and credited with the 'from-to' significance indicated by the arrows fitted to B.1. is equal to the vector $\bar{\beta}\ L_{(4)}$.

A very special significance attaches to the unit vector represented by $\bar{\imath}$. $\bar{\imath}$ is what is known as a '*Right versor*'; and this means that, if any other unit vector such as our $\bar{\beta}$ is multiplied by the unit vector $\bar{\imath}$, the result is to change through a complete right angle the direction in which the $\bar{\beta}$ unit vector points. This change is assumed, usually, to be anticlockwise, although that is purely a matter of convention. Hence, if our $\bar{\beta}L_{(4)}$ directed parallel to the $L_{(4)}$ axis is multiplied by $\bar{\imath}$, the result is to make it directed vertically upward parallel to the three-dimensional space axis of the figure.

Now, we have seen that, as the space B.1. travels in the

$L_{(4)}$ direction, the point O in the world-line *ab*, where *ab* is intersected by B.1., travels up the B.1. space. Hence *go* is a displacement vector in B.1. space; a displacement vector which we shall call $\overline{L}_2$. And since *ab* is inclined at 45 degrees to $L_{(4)}$, the displacement of O in B.1. space will be equal in *amount* to the amount by which B.1. is displaced in $L_{(4)}$. If we equip the L_1 and the $L_{(4)}$ axes with equal scale markings —so that we are using a squared 'mesh system'—the scalar value of the $\overline{L}_2$ vector will be equal to the scalar value of the $\overline{L_{(4)}}$ vector. Nevertheless, the vector $\overline{L}_2$ is not the same as the vector $\overline{L_{(4)}}$—the *directions* are different. $\overline{L}_2$ is at right angles to $\overline{L_{(4)}}$. But it is quite correct to say that the $\overline{L}_2$ vector is simply the $\overline{L_{(4)}}$ vector *multiplied by* $\bar{\imath}$.

An ordinary unit vector has the scalar value of an ordinary unit: namely, 1. But the unit vector $\bar{\imath}$—the 'Right Versor'—differs from the others in this respect. Multiplying β by $\bar{\imath}$ turns the direction of β through a right angle. Multiplying again by $\bar{\imath}$ would turn β's direction through another right angle, so that β would be pointing in a direction diametrically opposite to that in which it was pointing at the beginning of the double operation. If the original direction be regarded as positive, the final direction will be negative. In other words:

$$\bar{\beta} \times \bar{\imath} \times \bar{\imath} = -\bar{\beta} \quad .$$

consequently,

$$\text{the scalar value of } i^2 = \frac{-\beta}{\beta} = -1$$

and

$$\text{the scalar } i = \sqrt{-1} \quad \ldots\ldots\ldots\ldots (1)$$

Now, we saw a little way above that the $\overline{L}_2$ vector is simply the $\overline{L_{(4)}}$ vector multiplied by $\bar{\imath}$; and we saw earlier (page 147) that $\overline{L_{(4)}}$ can be written $\bar{\beta}L_{(4)}$, where $L_{(4)}$ is the scalar multiple and $\bar{\beta}$ is a unit vector.

Hence we have $\overline{L_2} = \bar{i}\,\bar{\beta}\,L_{(4)}$

and, in scalars,

$$L_2 = i \times 1 \times L_{(4)} = i\,L_{(4)} \ldots\ldots\ldots\ldots (2)$$

Now, the *stationary* L_1 underlying the *travelling* B.1. space at *kg* can never indicate more than one position of the apparently moving body. Consequently, unlike an $\overline{L_2}$ length in the travelling B.1., it cannot, by itself, represent a *displacement* of the apparently moving body. It is not the scalar of a rotated vector $\bar{i}\,\overline{L_{(4)}}$.

So, *there is no scalar i in the composition of* L_1.

Keeping that in mind enables us to avoid what would be a sad mathematical error. It would be entirely wrong to say that, in Figure 9, $L_1 = L_2 = i\,L_{(4)}$. That would be putting an i into L_1's composition.

But L_2 *is* {from (2)} $i\,L_{(4)}$. And $L_{(4)} = L_1$. So it is correct to say that

$$L_2 = i\,L_{(4)} = i\,L_1 \ldots\ldots\ldots\ldots\ldots\ldots (3)$$

What we are trying to discover is how to arrive at the correct substratum L_1 which underlies L_2, when our sole source of information is the displacement of the body O in the travelling space B.1.

Equation (3) has shown us how to do this. It tells us that, when the 45 degree world-line is sloped as in Figure 9, we have merely to divide the L_2 displacement up the travelling B.1. by $\sqrt{-1}$, and the result is the correct L_1.

Now, glancing at Figure 9, we notice that the *static substratum* triangle *kgf*, with sides L_1 (underlying L_2), *gf* (or T_1) and *fk*, is a right-angled triangle. If we say that the length of the hypothenuse *fk* is one unit, we have

$$1^2 = T_1^2 + L_1^2 \ldots\ldots\ldots\ldots\ldots\ldots (4)$$

But the figure contains also a curious right-angled triangle, with sides L_2, T_1 and *f k*. The side L_2 is travelling with B.1. This is a non-static, continuously expanding triangle—ex-

panding as B.1. advances. Figure 9 gives us a, so-to-say, photographic 'snapshot' of this triangle. (The other, substratum triangle is one which we could photograph, at our leisure, by a 'time exposure', regardless of where L_2 may move meanwhile.) Now, in the snapshot of the expanding triangle we have:

$$1^2 = T_1^2 + L_2^2$$

or

$$1^2 = T_1^2 + (i\,L_1)^2 = T_1^2 - L_1^2 \quad \ldots\ldots (5)$$

which is very different from the substratum triangle in which, as we saw above, $1^2 = T_1^2 + L_1^2$.

We have to explain now why it is that we label the T_1 length in Figure 9 as being equal to $c\,T_2$.

We shall represent speed by the symbol V, and the unit of speed by [V]. The number of units of speed is indicated by v. So that

$$v\,[V] = V$$

Now, to us, time is the time which times the travel of B.1. along the fourth, spatial, dimension. We symbolize this time by T_2. It is to be noted that *any* motion which is supposed to be going on in relation to the static substratum is timed by this T_2. But when that fourth dimension in which a world-line extends is being regarded as representing time, we call this, time-1 or 'first-term' time, and symbolize it as T_1. This serves to distinguish it from the T_2 which we are regarding as real time. To the Classicist, the *substratum* L/T is speed V. To him, as to us, the *substratum* diagram is *not* vectorial—nothing in that diagram is supposed to be moving, and substratum 'V' in Figure 9 is simply a name for the tangent kg/fg of the angle θ. Any such tangent we describe as V_1. In the present instance $kg = fg$. so the tangent is 1, and our V_1 is unit V_1 represented by $[V_1]$. The speed of anything

moving in relation to the static substratum of the figure—the speed which is timed by T_2—we symbolize as V_2.

The speed of B.1.'s travelling is $L_{(4)}/T_2$, or T_1/T_2 and this is a V_2 speed. We give it, however, a special symbol of its own: namely, *c*. *c* is the conventional symbol for the speed of light in space devoid of matter, and we shall discover presently that our *c* is this particular speed. But we are not supposed to know that yet.

Any speed V has the 'physical dimensions' L/T, so $V \times T = (L/T) \times T = L$.

Here, $c = L_{(4)}/T_2$

So, $L_{(4)} = c\,T_2$ .....(6)

If we regard $L_{(4)}$ as being T_1, we have

$T_1 = c\,T_2$ .....(7)

But we must never fail to remember that in these two equations (6) and (7) the $L_{(4)}$ and T_1 which are equated to $c\,T_2$ are lengths in a 'snapshot' of that expanding triangle in which B.1. is one of the sides. It is a length which has been travelled over by B.1., and $c\,T_2$ is the scalar of a vector $\overline{c}\,T_2$ or $\overline{T}_1$.

Substituting $c\,T_2$ for T_1 in equation (5) on (page 150) gives us:

$I^2 = c^2\,T_2^2 - L_1^2$ .....(8)

which is the equation relating to the snapshot of the expanding triangle.

Now, Minkowski's famous equation, the one which gives him his four-dimensional 'hyperbolic' world is:

$I^2 = c^2\,T^2 - L^2$ .....(9)

This is the equation he actually used in his lecture.

I propose, however, to deal with Sir Arthur Eddington's interpretation of the hyperbolic world in question, as set forth in his famous book *Space Time and Gravitation*. This will make it easier for us to see how our L_1 and L_2, our T_1 and

T_2, enter into the Relativist equations in question. And it will enable us to utilize our simple equations, (4) $1^2 = T_1^2 + L_1^2$, and (5) $1^2 = T_1^2 - L_1^2$, for purposes of comparison.

Eddington's first significant equation in this respect is unnumbered, and it is to be found on page 47 of his book. We shall call it, equation (a). It is equivalent to

$$S^2 = L^2 - T^2 \quad \ldots\ldots\ldots\ldots\ldots\ldots (a)$$

Here S corresponds to the hypotenuse *fk* of our triangle *fkg* in Figure 9. Which triangle? The static, substratum triangle, or the snapshot of the expanding triangle with the travelling B.1. as one of its sides? *That is what we have to discover.*

From (a) we have, of course:

$$-S^2 = T^2 - L^2 \quad \ldots\ldots\ldots\ldots\ldots\ldots (b)$$

Eddington points out next (page 48) that, if we wish to avoid the unfamiliar geometry introduced by (a) we can substitute imaginary time T for 'real time' T, the relation between the two being $T = i\,T$, so that

$$T^2 = -T^2$$

and $$-T^2 = T^2$$

When this change is effected, equation (a) becomes

$$S^2 = T^2 + L^2$$

Now his equation (a) relates to a *static* four-dimensional world in which the velocity of light is represented by the tangent of the angle which a 45-degree line makes with his T axis. He has made that abundantly clear on page 46, last paragraph. So his L in equation (a) is our L_1. Substituting T for T does not affect that. So we may rewrite the last equation as

$$S^2 = T^2 + L_1^2 \quad \ldots\ldots\ldots\ldots\ldots\ldots (c)$$

and this agrees completely with *our* equation (4) on page 149 for the *same* static substratum triangle, namely:

$$1^2 = T_1^2 + L_1^2$$

The correspondence is complete. So, Eddington's T is simply our T_1.

Note now what Eddington has to say about the four-dimensional continuum formed by this equation $S^2 = T^2 + L_1^2$ or $1^2 = T_1^2 + L_1^2$.

'Everything is now symmetrical. . . . The continuum . . . is completely isotropic. . . . The observer's separation of this continuum into space and time consists in slicing it in some direction, viz., that perpendicular to the path along which he himself is travelling. . . . The observer is at liberty to orient his rectangular axes of x, y, z and T arbitrarily, just as in three dimensions he can orient his axes of x, y, z arbitrarily.'

'. . . The Fitzgerald contraction and the change of time measurement are given exactly by the usual formulae for rotation of rectilinear axes.'

And this is the substratum of Serialism!

Eddington prefers, however, to abandon T (abandon T_1). He prefers 'to return to' his T, (which he calls 'real time') and to 'face the difficulties of a strange geometry'.

(See pages 49 and 48 of his book.)

He wants a hyperbolic world.

His original equation (a) $S^2 = L^2 - T^2$, leading to (b) $-S^2 = T^2 - L^2$, is not, however, suited to his purpose. What he requires is $S^2 = T^2 - L^2$. So he openly and admittedly *changes the sign* of S^2 in (a) thus altering (a) to $-S^2 = L^2 - T^2$ and (b) to

$$S^2 = T^2 - L^2 \quad \ldots\ldots\ldots\ldots\ldots\ldots (d)$$

(See his page 53, first paragraph.)

Let us follow the same procedure with our equation (4), $1^2 = T_1^2 + L_1^2$, which, be it remembered, is *identical* with his (c), $S^2 = T^2 + L_1^2$.

First we have to 'return to' his T.

Our T_1 = his $\mathcal{T}$ = his T divided by *i*. So, to 'return to' his T, we have to multiply our T_1 in (4) (page 153) by *i*, giving us:

$$i^2 = -T_1^2 + L_1^2$$

Then we have to change the sign of i^2, giving us

$$-i^2 = -T_1^2 + L_1^2$$

or

$$i^2 = T_1^2 - L_1^2$$

which is our equation (5).

But that is the equation relating to the snapshot of *the expanding triangle with the side* L_2 *in* B.1. *travelling fourth-dimensionally along the* T_1 *axis.* And Eddington's equation (d) on page 53 is exactly the same as ours!

So, the two Relativist equations:

$$\text{(c)},\ S^2 = \mathcal{T}^2 + L^2,$$

giving an external world which is 'completely isotropic' and in which 'the Fitzgerald contraction' and similar Relativity effects are given by merely 'the usual formulae for rotation of rectilinear axes' and

$$\text{(d)},\ S^2 = T^2 - L^2$$

giving the semi-Euclidean, hyperbolic continuum are actually *Serial* equations—our equations (4) and (5). The first describes the static four-dimensional world which is apparent to a four-dimensional Observer-2 using his full outlook: the second describes the *erroneous* 'map' of that same isotropic *world which would be constructed by a three-dimensional* Observer-1 travelling, in B.1., through that world and extrapolating in time-1 from what he observes *within* his travelling B.1. To correct the error and make the extrapolation agree with what is apparent in Observer-2's direct four-dimensional view, we have to divide by *i* the L_1 in (5), $i^2 = T_1^2 - L_1^2$, and (d), $S^2 = T^2 - L^2$; a proceeding which gives us, of course, $i^2 = -T_1^2 + L_1^2$, and $S^2 = -T^2 + L^2$.

But the most important point to be borne in mind is that our

(5), $1^2 - T_1^2 - L_1^2$, and Eddington's (d) (page 53), $S^2 - T^2 - L^2$, both take into account, the first consciously, and the second, unconsciously, the existence of our travelling, three-dimensional world B.1.

It is perhaps advisable to warn the reader here that what Eddington calls 'real time' T (see page 153 of this *Appendix*) is neither our real time, T_2, nor our T_1. It is our T_1 divided by i.

In the Relativist diagrams of the static external world, as also in our Figure 9, the speed with which any element is travelling in three-dimensional space is indicated by the tangent of the angle which the world-line of the element in question makes with the time (our T_1) axis. The speed of light is indicated usually by the tangent of the angle made by a world line sloping at 45 degrees, that is to say by a tangent equal to unity. In Figure 9 this is the tangent of the angle marked θ, which tangent is og/fg. This is making the speed of light, L_1/T_1, the unit of speed. The speed of light is 300,000 kilometres per second, so, if you want to make that speed *unit* speed and indicate it by the tangent of a 45 degree angle, you will be drawing a square with the side representing T_1 labelled 'one second' and the *equal* side representing L_1 labelled '300,000 Kms.'. This holds good whether you are mapping out the isotropic world directly apparent to Observer-2 or are drawing the hyperbolic picture made by an Observer-1 ignorant of his travelling. So, in the static substratum of Figure 9, the speed of light is unity—our $[V_1]$. And we can label T_1, 'one second', and L_1, '300,000 Kms.'. L_2, equal to $i\,L_1$, will be also 300,000 kilometres long.

But in that figure we have another speed to consider: the speed with which B.1. is *travelling* over the substratum. And that speed, as we shall see in a moment, is the speed of light 300,000 Kms. per second which is *not being considered as unit speed.*

From our two equations:

$$(3)\ L_1 = \frac{L_2}{i}$$

and

$$(7)\ T_1 = c\ T_2$$

We have

$$\frac{L_1}{T_1} = \frac{L_2}{i\,c\,T_2}$$

Whence

$$i\,c\,V_1 = V_2 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (10)$$

The V_2 in this equation is the velocity, in terms of time-2, with which the point O (where B.1. intersects the diagonal *fk*) moves up B.1. bringing into being the vector of displacement $\bar{L}_2$ increasing at the rate V_2. The speed c is the speed with which B.1. containing L_2 travels along the T_1 or $L_{(4)}$ axis. That speed is also a V_2 speed. (It will be remembered that all speeds relative to the fixed substratum are speeds in terms of T_2: i.e. are equal to some moved-over substratum length divided by T_2. See *Appendix*, page 150.) But we give this speed of B.1. along T_1 the special name c. Both speeds, the speed of O up B.1., and the speed of B.1. along T_1 are directed speeds and, so, are velocities.

Equation (10) $i\,c\,V_1 = V_2$ tells us this:

When V_1 is $[V_1]$ as in Figure 9, the velocity of O up B.1. is

$$V_2 = i\,c\,[V_1] = i\,c \times 1$$

and the unknown velocity c, of B.1. along T_1, which is plain c without any i, can be discovered by observing the velocity V_2, of O up the travelling B.1., (namely $i\,c$), and dividing this by i.

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